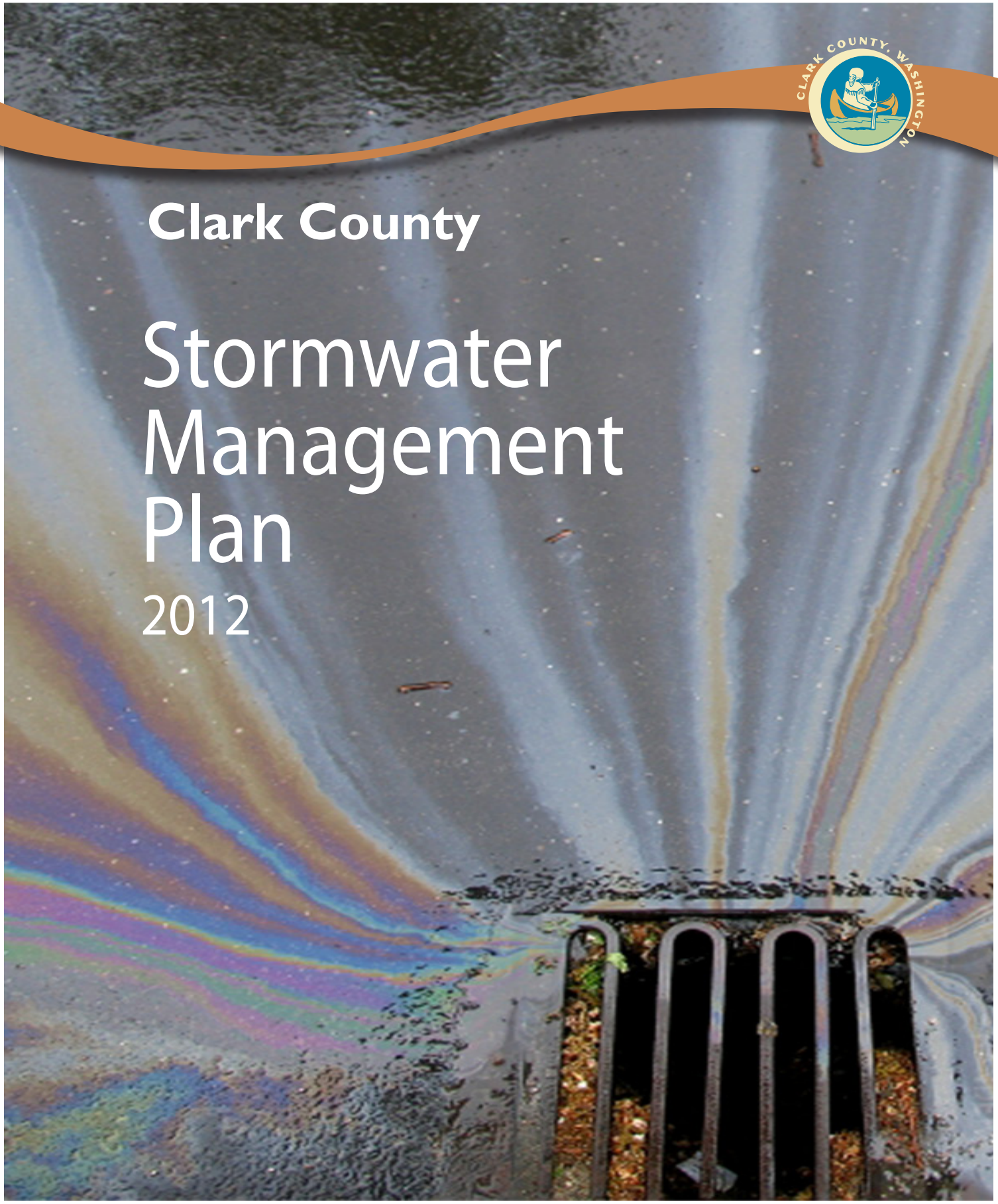

Clark County

Stormwater Management Plan

2012

Protecting water through stormwater management

Prepared by Clark County Environmental Services, Clean Water Program

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ACRONYMS AND GLOSSARY

- **AKART –** all known, available, and reasonable methods of prevention, control and treatment as the Ecology standard for the effort required to meet waste water discharge and NPDES permit requirements.
- **BMP** – best management practices (controls for stormwater runoff)
- **BOCC** – Board of Clark County Commissioners
- **CCSWMP** – *Clark County Stormwater Management Plan*
- **CIP** – capital improvement program
- **CWP** – The Clean Water Program, a division of Clark County Environmental Services
- **Ecology** – Washington State Department of Ecology
- **EPA** – Environmental Protection Agency
- **GIS** – geographic information system
- **GMS** – grounds maintenance specialist
- **IDDE** – illicit discharge detection and elimination
- **Illicit discharge** – a non-stormwater discharge or illegal connection to the storm sewer system (e.g. a sanitary sewer line connected to storm sewer system)
- **LID** – low impact development
- **MEP** – maximum extent practicable
- **MS4** – municipal separate storm sewer system
- **NOAA Fisheries** - National Oceanic and Atmospheric Administration, National Marine Fisheries Service
- **NOI** – Notice of Intent
- **NPDES** – National Pollutant Discharge Elimination Systems
- **NRS** – natural resources specialist
- **PPGS** – potential pollutant generating site
- **RCW** – Revised Code of Washington
- **SCIP** – Stormwater Capital Improvement Plan
- **SNAP** – Stormwater Needs Assessment Program
- **StormwaterClk** – a GIS database the county maintains for storm sewer infrastructure
- **SWMMPSB** – 1992 Stormwater Management Manual for the Puget Sound Basin, published by Department of Ecology
- **SMMWW** – 2005 *Stormwater Management Manual for Western Washington*, published by Ecology
- **SWMP** – stormwater management program
- **SWPPP** – stormwater pollution prevention plan
- **Tidemark** – a database the county maintains to track permits and code enforcement
- **TMDL** – total maximum daily load

- **UIC** – underground injection control
- **WAC** – Washington Administrative Code
- **WQDB** – *Water Quality Database*

Chapter 1
Introduction and Background

Leadbetter Road along Lacamas Lake, 1951

Clark County Stormwater Management Plan

The *Clark County Stormwater Management Plan* (*CCSWMP*) describes the various ways that Clark County manages stormwater and related water resources issues in the unincorporated area. It acts as a resource for the public to learn about the county's efforts to reduce pollution in stormwater, an informative guide for staff, and a compliance measure for the county's municipal stormwater permit.

Introduction

As the county's population continues to increase, Clark County is committed to responsible stormwater management to keep our waterways clean for people, fish, and wildlife.

The Clark County Department of Environmental Services administers the Clean Water Program to protect surface water and groundwater resources from polluted stormwater and to coordinate compliance with the federal Clean Water Act.

Primary responsibilities of the overall stormwater program include planning and building stormwater control facilities, water quality monitoring of stormwater and streams, public education and outreach, development and enforcement of water quality regulations, coordination with other municipalities, and maintenance of the county's stormwater system.

Stormwater and the NPDES Permit

Much of the pollution in Washington State's waters comes from many different, hard-to-trace sources with no obvious point of collection and discharge. It is called nonpoint source pollution and it travels to our streams, lakes, and other water bodies through polluted stormwater runoff carried by the county's storm sewer system.

Most U.S. cities and counties that collect stormwater runoff in municipal separate storm sewers and discharge it to surface waters are required to obtain a permit under the federal Clean Water Act. Clark County qualifies under the Environmental Protection Agency (EPA) stormwater regulations for the National Pollutant Discharge Elimination Systems (NPDES) Phase I Municipal Stormwater Permit program. In Washington State, EPA has delegated the Washington Department of Ecology (Ecology) the authority to develop and administer the NPDES permitting program.

Ecology issued the current NPDES Phase I Municipal Stormwater Permit to Clark County and other western Washington jurisdictions in January 2007 and revised it in June 2009.

Phase I permittees are cities and counties that operate large and medium municipal separate storm sewer systems (MS4s). Governmental bodies within their boundaries, such as state highway departments and drainage districts, are also required to meet permit requirements. The permit regulates discharges to waters of Washington State from the permittees' MS4s in compliance with Washington Water Pollution Control Law (Chapter 90.48 RCW) and the federal Clean Water Act (Title 33 USC, Section 1251 et seq.).

Permit Compliance

The NPDES Permit prescribes a variety of requirements and actions.

It lists 21 general conditions; these include, among others, a requirement to notify Ecology of spills, a duty to avoid bypassing water quality treatment and flow control facilities, and a requirement to notify Ecology of a failure to comply with the permit.

The permit also lists nine special conditions that, among other things, specify permit coverage, list permittee responsibilities, and under Special Condition S5, prescribe a ten-component stormwater management program (SWMP).

The SWMP consists of actions meeting the ten required components and any additional actions and activities necessary to comply with Total Maximum Daily Load (TMDL) requirements. Clark County's SWMP is designed to reduce pollutant discharges to the maximum extent practicable (MEP), meet requirements for managing stormwater using all known, available, and reasonable methods of prevention, control and treatment (AKART), and protect water quality.

The SWMP must be submitted to Ecology at the beginning of the permit term and subsequently updated to include any program changes or revisions that occur and be resubmitted in part or in whole with the annual report.

The Clark County Stormwater Management Plan and the Stormwater Management Program Distinguished

This *Clark County Stormwater Management Plan* (*CCSWMP*) encompasses efforts undertaken by Clark County, primarily in the Department of Environmental Services Clean Water Program, for the protection and monitoring of water quality and the management of stormwater and related concerns. The *CCSWMP* includes, as chapter 2, the NPDES SWMP required by Ecology.

THE CLEAN WATER PROGRAM

The Clean Water Program (CWP) in Clark County's Department of Environmental Services is responsible for a majority of the county's NPDES compliance actions and activities, coordination and reporting. The program coordinates with a variety of county departments to achieve and facilitate compliance. The CWP is the primary author of reports and other documents required by Ecology.

In addition to activities addressing NPDES Permit compliance and surface water resource management, the CWP manages other important stormwater-related activities, including registering stormwater injection wells regulated under the state's Underground Injection Control Rules (173-218 WAC) pursuant to the federal Safe Drinking Water Act, and giving engineering advice and support on flooding and drainage problems.

Funding & Budget

The Clean Water Program is funded primarily by an annual stormwater fee charged to developed parcels in the unincorporated area of the county. The county collects approximately $4.9 million annually from approximately 65,000 rate payers. Other sources of funding may include grants, the General Fund, and the Road Fund for stormwater management associated with county roadways.

Clean Water Fee

The rate for each equivalent residential unit (ERU), equaling 3,500 square feet of impervious surface, is $33 per year. Urban residential lots are presumed to contain one ERU. Larger residential lots, mostly located in the rural area, are assessed a lower fee based on the assumption that the impervious surfaces have a lesser impact on the county's stormwater system and on receiving waters. These prorated rates range from a high of $29.70 for lots from ½ to one acre in size to a low of $19.80 for lots greater than 20 acres. Commercial properties, roads, churches, and schools are assessed a fee based on the number of ERUs measured on the parcel.

Per Clark County Code 13.30A, fee revenues are used to fund stormwater management activities.

Clean Water Fund

Revenues from the Clean Water Fee, from grants awarded to the Clean Water Program, and from fines are deposited into the Clean Water Fund by the Clark County Treasurer. Revenues in excess of annual operating expenses for maintenance, repair, enforcement, assessment, monitoring, and education remain in the fund balance for use in constructing new public storm sewer infrastructure or in retrofitting inadequate facilities.

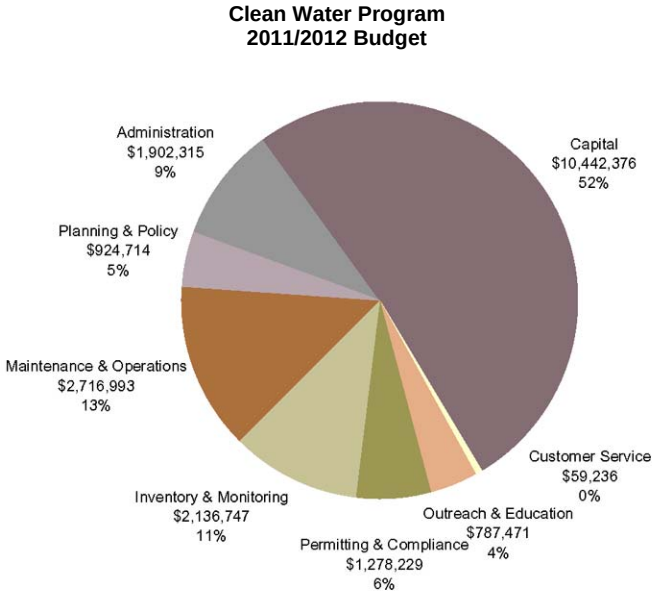
Budget

Clark County budgets on a two-year cycle. The Clean Water Program budget is set at the beginning of each cycle and modified, if necessary, through requests for additional appropriations from the Clean Water Fund during the biennium.

The budget is approved by the elected Board of Clark County Commissioners (BOCC). The BOCC sets the Clean Water Program budget in response to state priorities, expressed through the NPDES Municipal Stormwater Permit, and local priorities.

Areas of greatest expenditure include stormwater capital construction, maintenance and operation of storm sewer infrastructure, and assessment and monitoring of surface water and stormwater.

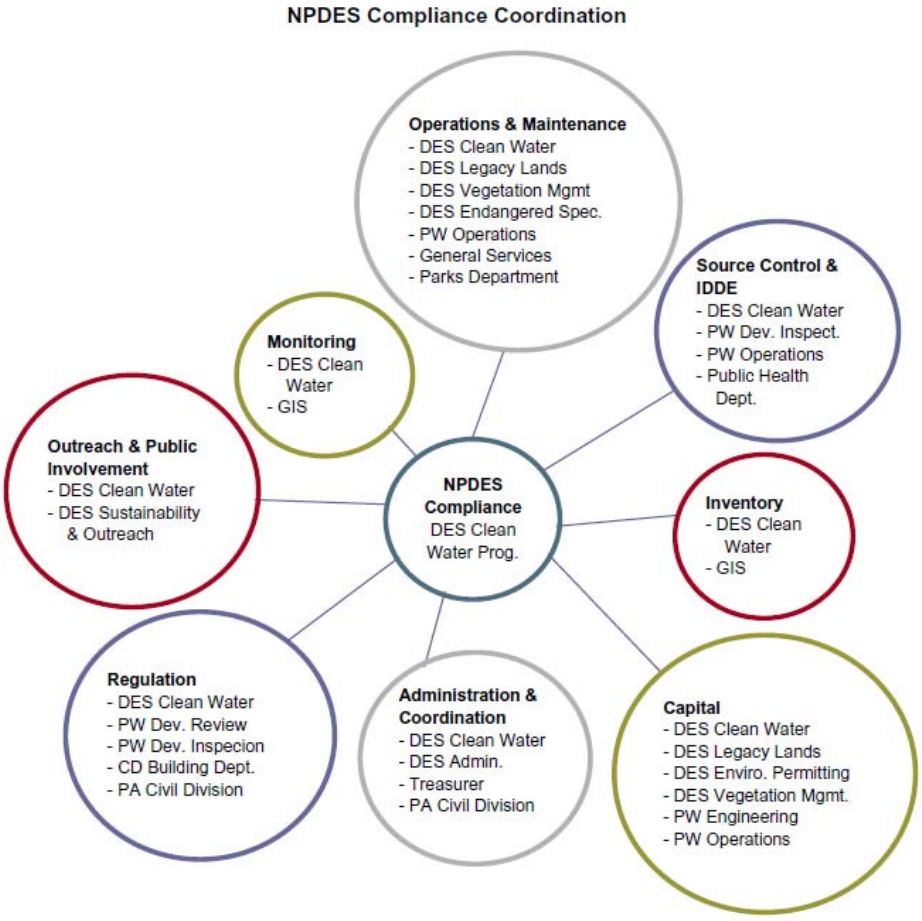
In recent years, a focus on building new stormwater facilities in under-served areas and on enhancing existing facilities has increased the budget overall as well as the proportion dedicated to capital construction. The consequence is a steady decline in the Clean Water Fund balance as both operational expenses and capital construction costs increase.



Organization & Staffing

The Clean Water Program employs a staff of 14 scientists, engineers, technical specialists, and administrators who perform essential stormwater management functions. The program also coordinates with other county departments for additional essential stormwater

services that fit within those department's core services. This organizational structure allows the Clean Water Program to minimize expenses by engaging technical and professional experts such as design engineers, road maintenance crews, and educators that are already employed by other county departments to complement a core staff of stormwater specialists.



CD = Community Development Department
DES = Department of Environmental Services
GIS = Geographic Information Systems Department
PA = Prosecuting Attorney
PW = Public Works Department

Clean Water Program staff is directly responsible for storm sewer system inventory; source control inspections; illicit connection and discharge inspections; stormwater capital planning; coordination with other jurisdictions and entities; and surface water and stormwater assessment and monitoring.

The program coordinates with other county departments to collect and process the Clean Water Fee; operate, inspect and maintain the storm sewer system; manage the design and construction of stormwater capital improvements; enforce development and

building regulations related to NPDES Permit compliance; inform and educate the public about stormwater problems and solutions; and support the Clean Water Program with database programming and analysis.

County departments are responsible for complying with NPDES Permit requirements in their operational activities by directive of the County Administrator.

Chapter 2
Stormwater Management Program

Muddy stormwater runoff in Cougar Creek during a storm

Section 1
Legal Authority

Regulatory Requirements Summary

NPDES Permit S5.C.1 – Legal Authority

The NPDES Permit requires the county to demonstrate that it has the legal authority to control discharges to and from its municipal separate storm sewer system (MS4).

Legal Authority to Regulate

Clark County maintains the legal authority required by the permit to control discharges to and from its MS4.

Clark County Code Chapter 13.26A – Water Quality

Chapter 13.26A prohibits illicit discharges and spills into the county's MS4, requires the control of industrial site runoff, and adopts source control requirements in the *Clark County Pollution Control Manual*. It maintains the county's authority to inspect and enforce its provisions.

Clark County Code Title 32 – Enforcement

Title 32 permits Clark County to enforce any of its civil codes through inspection, surveillance, monitoring, and enforcement actions.

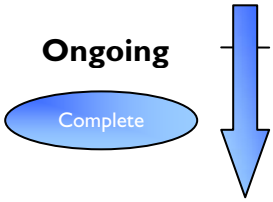
Clark County Code Title 40 – Unified Development Code

Title 40 contains a suite of requirements regulating the design, construction, and operation of stormwater controls on development and re-development sites that will discharge to the MS4 or to waters of the state.

Legislative Authority of the Board of Clark County Commissioners

Through the legislative authority of the Board of Clark County Commissioners, Clark County has the ability to enter into contracts and intergovernmental agreements with other permittees and secondary permittees for the purpose of controlling pollutants entering or leaving the county MS4.

TIMELINE



- Maintain legal authority to control discharges to and from the MS4

FOR MORE INFORMATION ON THE COUNTY'S LEGAL AUTHORITY TO CONTROL DISCHARGES TO AND FROM THE MS4

RON WIERENGA, CLEAN WATER PROGRAM MANAGER, 397-2121, X4264
RON.WIERENGA@CLARK.WA.GOV

Section 2
Inventorying and Mapping the Storm Sewer Infrastructure

Clark County operates a large municipal separate storm sewer system (MS4) throughout the unincorporated area.

An MS4 is a conveyance or system of conveyances that meets all of the following criteria:

1. Owned by a state, city, town, village, or other public entity that discharges to waters of the U.S.
2. Designed or used to collect or convey stormwater (including storm drains, pipes, ditches, etc.).
3. Not a combined sewer.
4. Not part of a publicly owned treatment works (sewage treatment plant).

A related type of infrastructure used to manage stormwater is a class V injection control well, which allows stormwater to be disposed directly into the ground instead of to a surface water body.

Clark County inventories and maps its storm sewer infrastructure and class V injection control wells to serve a variety of purposes. The inventory is a primary source of information for operation and maintenance of the MS4, stormwater well registration, illicit discharge detection and removal, drainage and source control support, stormwater assessment and monitoring, and capital planning.

Clark County administers a comprehensive program to inventory the storm sewer system in a geographic information system (GIS) database called *StormwaterClk*. All known existing infrastructure has been inventoried and mapped. An ongoing program inventories and maps storm sewer infrastructure built in the course of development and public capital improvement projects. The inventory includes all stormwater infrastructures inside of and outside of the county MS4, including:

- Flow control and water quality treatment facilities
- UIC-regulated Class V injection wells
- County outfall locations
- Conveyances (pipes, ditches, and culverts)
- Interconnections with other municipal systems
- Connections to the county MS4

Regulatory Requirements Summary

NPDES Permit – S5.C.2. Municipal Separate Storm Sewer Mapping and Documentation

The NPDES Permit requires the county to map and document components of the MS4, receiving waters, outfall catchments, and land uses within the MS4.

Chapter 173-218 WAC – Underground Injection Control (UIC) Program

Pursuant to Chapter 90.48 RCW, Washington code requires owners of class V injection control wells (underground drywells and infiltration trenches with perforated pipes that dispose stormwater into the ground) to comply with regulations designed to protect groundwater quality for use as public water supplies. The state rules require owners of more than 50 stormwater wells to register all existing wells by February 3, 2011. Clark County owns approximately 2,200 wells that are regulated under this rule.

County Policies, Rules and Regulations

Clark County Code Chapter 40.385 – Stormwater and Erosion Control

Chapter 40.385 describes county regulations for ownership of stormwater facilities and the lands on which they are located. Section 40.385.040 sets forth requirements to submit record drawings for completed projects. Section 40.385.020 sets forth requirements to document facility ownership.

Section 40.385.020 requires developers to register Class V underground injection control wells that manage stormwater with the Department of Ecology and to notify the county prior to use.

Section 40.385.040 requires developers to submit record drawings to the county prior to 1) the issuance of building permits for single-family/duplex residential subdivisions, 2) the issuance of occupancy permits for site plan reviews (commercial development), and 3) within sixty days following completion of construction for other types of development.

Clark County Code Chapter 40.540.070 – Final Plat

Chapter 40.540.070 describes county regulations for information about dedications and easements for utilities that must be contained on a plat.

Revised Code of Washington Chapter 58.17.165 – Plats – subdivisions – dedications

Washington state code prescribes information that must be shown on a plat when land is subdivided, including dedications of roadways and utilities and stormwater easements, tracts, or lots.

Public Project Record Drawings Policy

Clark County Public Works Engineering Program maintains a policy for the preparation and distribution of record drawings, also known as as-built drawings, after completion of county capital improvement projects such as roads, parks, and stormwater facilities.

TOOLS

StormwaterClk

Clark County Environmental Services maintains a stormwater database called *StormwaterClk* within its GIS. The database is administered by the GIS Department, while data is maintained and updated by the Clean Water Program.

Tidemark

Clark County Community Development and Public Works maintain *Tidemark*, a database of regulatory and enforcement cases, including permits for land division and development projects.

Annexation Tracker

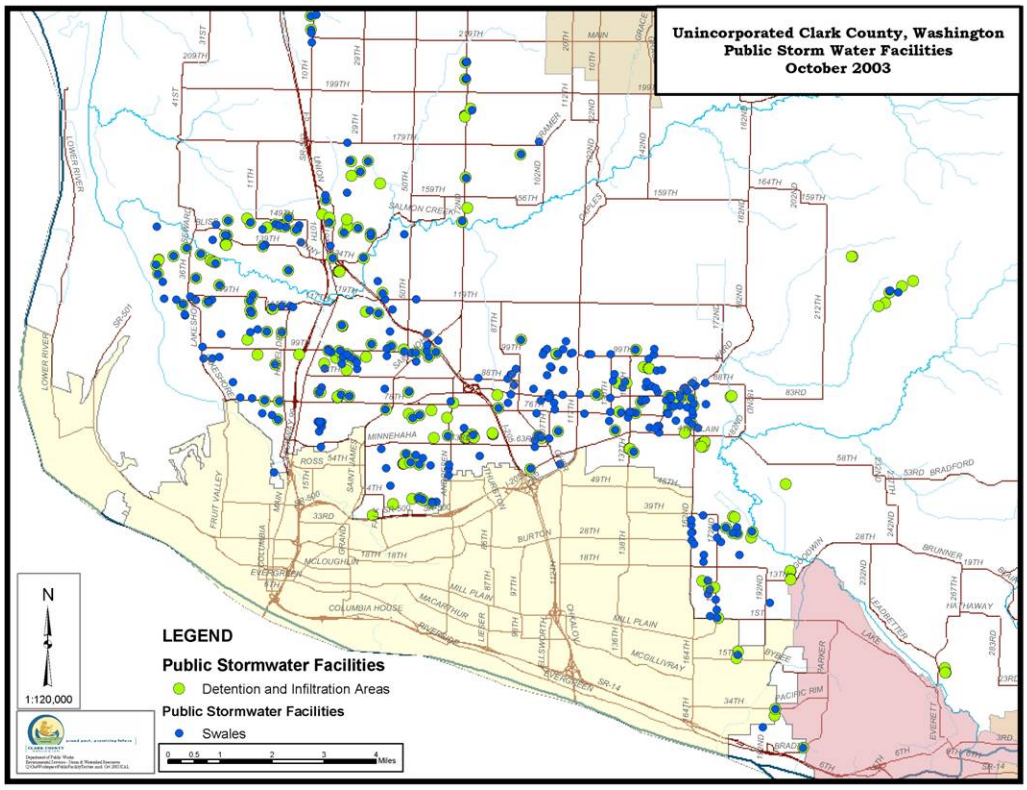
Annexation Tracker is an application developed by the GIS Department that helps county departments track annexations.

Ongoing Inventory and Mapping

Purpose

Clark County maps and inventories stormwater treatment and control infrastructure because an accurate and complete inventory is critical to a successful program to inspect, maintain and regulate stormwater conveyances, detention facilities, and water quality facilities.

As part of the process, new outfalls, Class V injection control wells, interconnections, and connections also are documented.



Clark County has been inventorying the MS4 in a GIS since 1999

Responsibilities Matrix

Task	DES CWP Mgr	DES CWP NPDES Mgr	DES CWP Eng. Tech	PW Dev. Engineering Planning Tech	PW Dev. Engineering Manager	PW Construction Management Engineer	PW Construction Mgmt. OA	PW Construction Manager	PW Engineering Program Manager	PW Survey	PW Real Property Services
Notify CWP of new private development completion	O	O	I	P	A	O	O	O	O	O	O
Notify CWP of new county capital improvement project physical completion	O	O	I	O	O	O	P	A	O	I	O
Notify CWP of new county capital improvement project final acceptance	O	O	I	O	O	O	P	A	O	I	O
Notify CWP of new WSDOT projects	*To Be Determined*										
Gather project information	A	S	P	C	O	C	O	O	A	C	C
Notify CWP of county project As-built location	O	O	I	O	O	S	O	S	O	P	O
Make final decision on maintenance owner	A	S	S	O	P	C	O	O	O	C	C
Map infrastructure	A	O	P	O	O	O	O	O	O	O	O
Track progress	A	S	P	O	O	O	O	O	O	O	O
Transfer information to Operations	A	S	P	O	O	O	O	O	O	O	O
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted											

Background

Most stormwater infrastructure and conveyances in the county are built by the private sector during residential and commercial development. Other facilities are built by the county or Washington State Department of Transportation (WSDOT) to handle runoff from new roads, parks, and other construction projects. The Clean Water Program builds some stormwater facilities to retrofit developed areas that lack adequate flow control or treatment. (See County Capital Improvements on page 62.)

After a project is constructed, Clean Water Program staff inventory the new facility and its related infrastructure, such as catch basins and other conveyances, in *StormwaterClk*.

Notification and Tracking

The first step of inventorying is becoming aware that a new development or road project, potentially with stormwater infrastructure, has been completed. Clean Water Program staff will receive different notifications depending on the source of the project (see below).

Upon receipt of a notification, the Clean Water Program engineering technician in charge of stormwater inventory will begin tracking the project. The engineering technician will create a folder for the project on the Clean Water Program's network drive, where copies of relevant documents relating to the project's storm sewer infrastructure will be stored.

Notification will set a 90-day clock for inventorying and mapping the new infrastructure in the GIS.

Private Sector Projects Notification

The Public Works Development Engineering planning technician will notify the Clean Water Program engineering technician that a new residential or commercial development has been completed by forwarding a copy of the completion of construction letter sent to the developer.

In some cases, the first notification to the Clean Water Program may be a different document, such as notice of a plat recording. In those cases, the engineering technician will begin tracking the project as documented above.

County Projects Notification - Physical Completion

The Public Works Engineering Program Construction Management section will notify the engineering technician that a new public project is nearing completion by forwarding a copy of the physical completion letter sent to the construction contractor. At this stage, the project's stormwater facilities are functional.

The Construction Management section will send a second notification to the engineering technician by forwarding a copy of the final acceptance letter sent to the construction contractor. The second notice, which may arrive months or years after the first notice, will initiate a task to verify and update *StormwaterClk*, if necessary.

WSDOT Projects Notification

In 2012, Clean Water Program staff will develop a process for detecting the completion of new WSDOT projects.

Notification of Existing Projects

Infrequently, the engineering technician will discover engineering drawings or other evidence of an existing project that does not appear in the inventory. In those cases, the engineering technician will begin the mapping process as though it were a new facility by researching information about the project (see below), potentially using legacy data storage systems not discussed here.

Research

The engineering technician will research and assemble relevant documentation about the project from various sources, including Public Works Development Engineering and the Auditor.

To map the stormwater infrastructure, the engineering technician needs:

- Engineering drawings of the project
- For private sector projects, the preferred source is a record drawing (sometimes also called an as-built). An acceptable alternate source is an approved construction plan.
- For county projects, the preferred source is a record drawing; however, most projects will be documented initially from the final construction plan (also called 100% design plan or similar).
- Geographic location of the infrastructure.

Other helpful information includes:

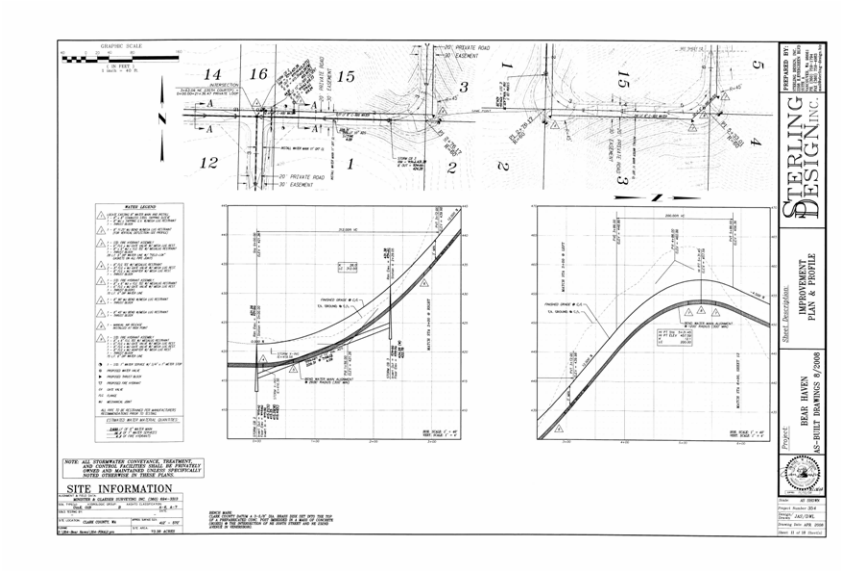
- Maintenance responsibility for the infrastructure.
- Ownership of tracts or parcels containing the facilities, if any.
- Location of easements containing the facilities and related infrastructure, if any.

Finding documentation may take several steps, outlined below.

Locate and Verify Engineering Drawings

For private sector projects, record drawings are submitted by the private developer to the Development Engineering program. The engineering technician is then notified of the availability of record drawings on an ftp site.

For county capital improvement projects, the engineering technician retains copies of construction plans until record drawings become available at the project contract completion. Public Works Survey section maintains electronic copies of county projects and places them on the county Olympus server where they are accessible to the engineering technician. In cases where record drawings are not available, the engineering technician will verify the accuracy of construction design plans.



Select Sheets

Once engineering drawings have been located, the engineering technician will review the entire plan set and select sheets relevant to the storm system from the set. Relevant sheets may include:

- One or more plan views of the storm system and facilities (variously called storm sewer plan, street and storm plan, drainage plan, utility plan, or similar name).
- One or more profile views of the storm system and facilities.
- One or more detail views of particular storm system components.

The engineering technician will copy selected sheets of electronic engineering drawings to the project's folder on the Clean Water Program's network directory.

Locate Ownership and Maintenance Responsibility Information

The engineering technician will look for several types of ownership, responsibility, and legal access information, including:

- The party responsible for maintaining the stormwater infrastructure.
- The owner of parcel(s) underlying any treatment or flow control facilities.
- The existence of easements for access to stormwater facilities and conveyances.

Information may be contained in several documents, including the plat, the engineering drawings, the final site plan, and some recorded legal documents.

Determine Ownership and Maintenance Responsibility

Responsibility for maintaining facilities may change over time. At this stage, the engineering technician will determine the current maintenance responsibility.

The engineering technician will evaluate information on the plat, final site plan, engineering drawings, and other documents as necessary to determine maintenance responsibility of the facility and ownership of the parcel, if any, on which it is sited.

If the engineering technician cannot determine maintenance responsibility due to conflicting or missing information, then the Clean Water Program manager will make the determination.

Inventory and Map (Digitize)

The engineering technician will find the project's location in the GIS. Using the assembled information, the technician will digitize the project's stormwater facility or facilities and related infrastructure, such as conveyance and drywells, in *StormwaterClk.*

The engineering technician also will enter attributes of storm system components in the database. Attributes are unique to each component type. Some of the most important attributes that are common to most types of components include:

- Subwatershed (auto-populated).
- Custodial county department.
- Service status.
- Installation date.
- Elevations.
- Dimensions (pipe diameter, length, etc.).
- Facility name (for facility polygons only).
- Serial number of the parcel containing the facility (if relevant).

Track

After digitizing, the engineering technician will move the project's folder on the Clean Water Program network drive to the "Public Facilities" or the "Private Facilities" folder.

Transfer Information

The engineering technician will notify Public Works Operations and Maintenance division and Public Works Construction Management that there is a new facility included in the county inventory.

Update County Projects

County projects may be updated once or twice near the beginning of their stormwater facility's lifecycles.

First Update – Final Acceptance

The Public Works Engineering Program Construction Management section will notify the Clean Water Program engineering technician that a public project has been accepted into county ownership by forwarding a copy of the final acceptance letter sent to the construction contractor. At this stage, the responsibility for stormwater facility maintenance transfers from the contractor to the county.

The engineering technician will update the custodial department attribute of the project's storm infrastructure in *StormwaterClk*.

Second Update – Record Drawings

The Public Works Engineering Program will prepare record drawings of a project within 12 weeks of final acceptance, following the *As-Built Plan Preparation* policy. Survey staff will notify the Clean Water Program engineering technician about the location of as-built drawings for new projects.

The engineering technician will update *StormwaterClk* records with links to the engineering drawings on the *Olympus* drive and also will verify that the GIS matches the record drawings, making updates if necessary.

Outputs

- Updates to *StormwaterClk*

MAP OUTFALL ATTRIBUTES

Purpose

The NPDES Permit requires the county to map attributes of outfalls in urban and suburbanizing subwatersheds, including the following attributes and features:

- Land use (attribute).
- Tributary conveyances (feature).
- Outfall catchments (feature).

Responsibilities Matrix

Task	DES CWP Mgr	DES CWP NPDES Mgr	DES CWP Eng. Tech	Assessment and GIS Department
Map land use	O	O	O	A/P
Map receiving waters	* Complete *			
Map areas not draining to outfalls	* Complete *			
Map outfall catchments	* Complete *			
Map tributary conveyances	* Complete *			
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted				

Procedures

Map Outfall Catchments

In 2010, the Clean Water Program completed mapping catchments to most outfalls. This includes 487 outfalls, most of which are smaller than 24" nominal diameter. Catchments to new outfalls will be mapped as outfalls are added.

Map Outfall Land Use

Known outfalls are mapped, and new outfalls will be mapped as part of the ongoing inventory and mapping (above). Outfall catchments for most of the Urban Growth Areas (UGAs) are now mapped. As a result of Clark County's function as a land use regulator, the Clark County Assessor maintains land use data at the parcel scale in a GIS.

To produce a map of land uses for outfalls, Clean Water Program staff or GIS Department staff will overlay land use data with outfall catchments in the GIS upon request or as needed.

Map Tributary Conveyances

Clark County completed an inventory of the conveyance system in early 2010.

Outputs

- Outfall land use map
- Conveyances mapped in *StormwaterClk*
- GIS layer of outfall catchments

Map Service Area Not Draining to Surface Water

Purpose

The NPDES permit requires the county to map the urban service area of the MS4 that does not drain to surface water, such as areas that drain to drywells.

Responsibilities Matrix

Not applicable.

Procedures

In 2010, the Clean Water Program NPDES Permit coordinator and the GIS Department developed a process for mapping areas served by the MS4 that do not drain to surface water as part of the process to map outfall catchments (above). This action is complete.

Outputs

- Map of the urban area MS4 service area not draining to surface water

Inventory Quality Assurance and Reporting

Purpose

To assure accuracy of data in *StormwaterClk*, Clark County will periodically assess the data using various methods.

Responsibilities Matrix

Task	DES CWP Mgr	DES CWP NPDES Mgr	DES CWP Eng. Tech	Assessment and GIS Department
Ongoing Data Updates	A	S	P	O
Reporting	A	S	P	S
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted				

Ongoing Data Updates

The NPDES Permit coordinator and the engineering technician will routinely and periodically verify accuracy of stormwater infrastructure in the GIS as annexations occur and as more accurate project plans are produced or discovered.

Annexation Updates

Annually, the engineering technician will check *Annexation Tracker* to determine if stormwater infrastructure has been annexed to a city. The engineering technician will

change facility ownership attributes and update county MS4 municipal connection points in *StormwaterClk* where infrastructure has been annexed.

The engineering technician also will provide Public Works Real Property with a list of county-operated stormwater facilities annexed into each city. A real property agent or a real property assistant will have responsibility for ensuring that property records are updated with the Assessor and for notifying the annexing municipality.

Ongoing Corrections

As possible mistakes in the data or out-of-date information are discovered, the engineering technician will keep a list of possible corrections, then periodically research and, if necessary, correct *StormwaterClk*. Possible sources of discovery include Stormwater Needs Assessment Program research (see page 129), discovery by Public Works Operations & Maintenance personnel and stormwater facility inspectors, and discovery by Clean Water Program engineers.

Reporting

Monthly, quarterly, and annual performance measures to report inventory status were established in 2010 and are reported as scheduled.

Outputs

- Data updates in *StormwaterClk*
- Reports from *StormwaterClk*

Underground Injection Control (UIC) Registration and Risk Assessment

Purpose

Pursuant to the Safe Water Drinking Act and Chapter 90.48 RCW, Washington Administrative Code 173-218 requires the county to register new UIC-regulated stormwater disposal wells, also called Class V injection wells, prior to construction. Existing Class V injection wells owned and operated by the county must be registered with the Department of Ecology by February 3, 2011. The code also requires the county to assess the risk level of all UIC-regulated wells it operates by February 3, 2013.

Responsibilities Matrix

Task	DES CWP Mgr	DES CWP Eng. Tech	DES CWP Engineer	GIS Department
Map new Class V injection wells	A	P	O	O
Locate unregistered Class V injection wells	A	S	P	O
Update UIC spreadsheet	A	O	P	O
Submit registrations to Ecology	A	O	P	O
Update registration status in *StormwaterClk*	A	S	P	S
Well Risk Assessment (TBD)	A	S	P	S
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted				

Register Existing County Class V Injection Wells

A Clean Water Program engineer will submit well registrations to the Department of Ecology for all known existing Class V injection wells owned and operated by Clark County that were installed prior to 2007.

Locate Wells

Class V injection wells in subdivisions and road right-of-way are mapped as part of the ongoing program to map stormwater infrastructure (above). All known existing UIC-regulated wells in unincorporated Clark County have been mapped and their registration status recorded in *StormwaterClk*.

Periodically, the engineer will search for unregistered wells in *StormwaterClk* and transfer information about them to a registration spreadsheet supplied by Ecology.

Update UIC Registration Spreadsheet

The UIC Registration spreadsheet contains several worksheets to list different types of Class V injection wells. The engineer will list unregistered wells and record their characteristics. Although each worksheet tracks a unique set of characteristics, generally, the spreadsheet tracks type of well, location, construction date, status, and other attributes related to level of risk to groundwater.

Submit Registrations

Periodically, the engineer will submit the registration spreadsheet to Ecology's Water Quality Program.

Update StormwaterClk

The engineer will update the registration status of wells in *StormwaterClk*.

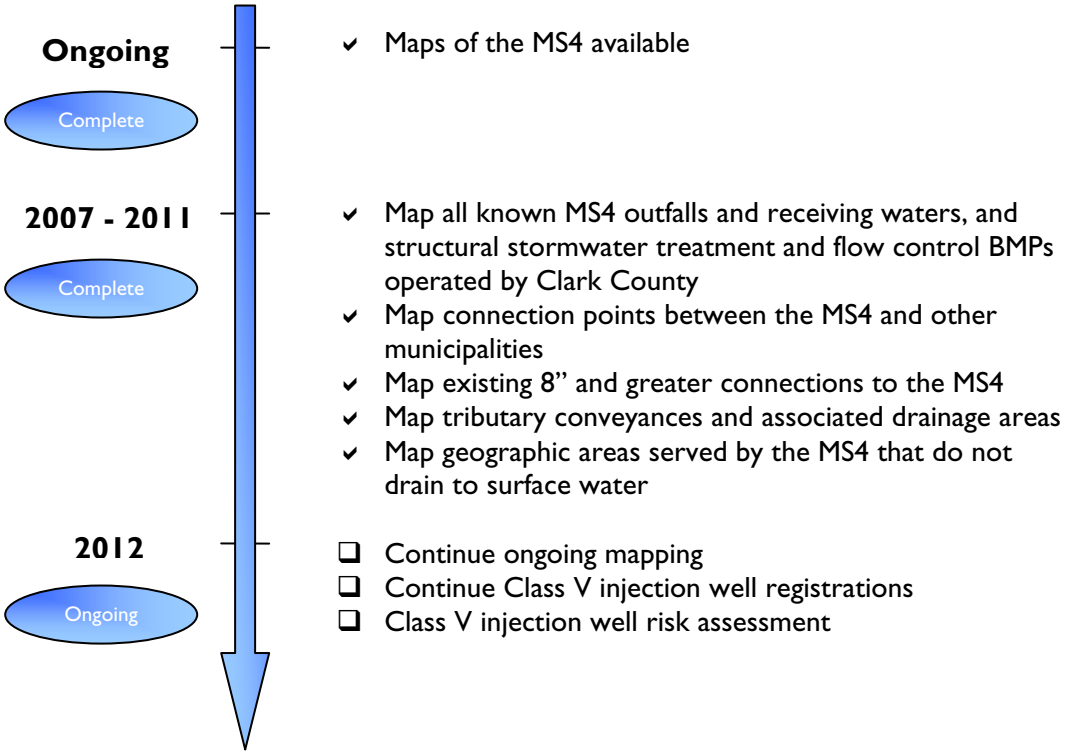
Well Risk Assessment

In 2012, Clean Water Program staff will develop a plan for completing an assessment of risk to groundwater for each UIC-regulated well owned by the county.

Outputs

- Spreadsheets of UIC-regulated wells registered with Ecology
- Updates to *StormwaterClk*
- Outputs from well risk assessments will be determined.

TIMELINE



FOR MORE INFORMATION ON MAPPING THE MS4

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Section 3
Operating and Maintaining the Storm Sewer System, County Property and Roadways

The county inspects and maintains storm sewer infrastructure to maintain its ability to convey, detain, infiltrate, and treat stormwater. Clark County also manages its properties and roadways to reduce stormwater impacts from potential pollutant sources such as erosion, fertilizers, and pesticides.

County crew replacing filters in a stormwater filter vault system

Regulatory Requirements Summary

NPDES Permit – S5.C.9 Operations and Maintenance

The NPDES Permit requires the county to manage its maintenance activities and regulate non-county stormwater facilities to prevent or reduce stormwater impacts. The program must include:

- Maintenance standards and schedules for public and private stormwater facilities.
- Street operation and maintenance practices that reduce stormwater impacts.
- Policies and procedures to reduce pollution from pesticides, herbicides, and fertilizers used by the county.
- Operational practices that reduce stormwater impacts for equipment yards and storage facilities.
- Staff training.

Stormwater Management Manual for Western Washington

The permit requires the use of source control BMPs equivalent to Volume IV of the *Stormwater Management Manual for Western Washington* (Ecology, 2005) (*SMMWW*).

The permit also requires a stormwater facility maintenance inspection program equivalent to Volume V of the *SMMWW*.

Chapter 173-218 WAC – Underground Injection Control (UIC) Program

Pursuant to Chapter 90.48 RCW, Washington Administrative Code requires the county to comply with regulations controlling the discharge of fluids, such as stormwater, into Class V injection control wells. Examples of wells that handle stormwater include drywells, infiltration trenches, and French drains.

The stormwater management program addresses the UIC Program requirement to maintain and address pollutant sources.

Endangered Species Act 4(d) Rule

The federal Endangered Species Act prohibits “take" of threatened or endangered salmon. Take is harassment, harm, wounding, or killing of an ESA-listed salmon, or harming the critical habitat upon which it depends. The 4(d) rule directly prohibits take without authorization. However, the prohibition is limited under 13 different programs that describe procedures and processes by which an activity may be conducted to contribute to the conservation of the species overall. Road maintenance is an activity that, when

conducted according to the Regional Road Maintenance Forum guidelines, is certified by National Marine Fisheries Service to contribute to the conservation of listed salmon.

County Policies, Rules and Regulations

Clark County Code Chapter 40.385 – Stormwater and Erosion Control

Chapter 40.385 requires newly constructed stormwater treatment facilities to be maintained in accordance with the county *Stormwater Facility Maintenance Manual*, and it gives the county authority to inspect privately-operated facilities for compliance.

The chapter also requires ownership and maintenance responsibility of private facilities to be noted on subdivision final plats. The county maintenance manual is referenced in the 2009 modifications to the NPDES Phase I municipal stormwater permit.

Clark County Code Chapter 13.26A – Water Quality

Chapter 13.26A requires inspection and maintenance of all public and private stormwater facilities and Class V injection control wells in accordance with the *Stormwater Facility Maintenance Manual*, and adopts the *Clark County Stormwater Pollution Control Manual* that provides BMPs for business and public agency activities such as materials handling, landscape management, trash management and building exterior maintenance.

Stormwater Facility Maintenance Manual

The *Stormwater Facility Maintenance Manual* adopts maintenance standards for public and private stormwater facilities equivalent to the *SMMWW*.

Clark County Stormwater Pollution Control Manual

The *Clark County Stormwater Pollution Control Manual: Best Management Practices for Businesses and Government Agencies* adopts source control and treatment standards for public and private properties equivalent to Volume IV of the *SMMWW*.

Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property

The *Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property* manual provides water quality and vegetation management practices for county maintenance crews pursuant to Clark County Code Chapter 13.26A. The manual was adopted for county use by directive of the County Administrator.

Executive Direction

In 2008, County Administrator Bill Barron directed the departments of Community Development, Community Planning, General Services, Public Works, the Endangered Species Act Office, and Vancouver-Clark Parks and Recreation to comply with the county's NPDES Phase I Municipal Stormwater Permit. The directive refers to activities that are directly regulated by the permit and to activities that support the county's water quality protection goals.

Enforcement Procedures for Un-maintained Private Stormwater Facilities

In 2009, the Clean Water Program developed a policy on responding to non-compliant private regulated stormwater facilities.

Environmentally Responsible Purchasing Policy

Clark County adopted its Environmentally Responsible Purchasing Policy in 2004. One element addresses purchase of landscaping and vegetation maintenance products, including pesticides. The policy establishes a set of criteria, any of which will disqualify a pesticide from purchase, and a waiver system, allowing chemicals with no equivalent that is more environmentally-friendly to be used within specific limiting guidelines.

ESA Regional Road Maintenance Forum

Clark County Public Works has been a member of the ESA Regional Road Maintenance Forum since 2003. The group assisted the county in developing a regional road maintenance program designed to meet the requirements of the Endangered Species Act (ESA). In 2004, NOAA Fisheries approved the program and determined that it was compliant with the ESA 4(d) rule. The program seeks to protect salmon and steelhead by relying on the extensive use of pre-approved BMPs for routine maintenance activities.

TOOLS

Maintenance Management System (MMS)

The *Maintenance Management System* (MMS) is a database operated by Public Works for tracking infrastructure assets, recording condition, and scheduling inspections and maintenance. The MMS was implemented in 2011 and continues to evolve. The MMS will be used to prioritize, schedule, and track stormwater infrastructure inspections and maintenance by Public Works crews, as well as track asset condition.

For stormwater facilities and related infrastructure, the inventory in MMS is provided directly from *StormwaterClk* (see Inventorying and Mapping the Storm Sewer System on page 9).

INSPECTIONS

Purpose

Clark County inspects both county-owned and other stormwater facilities to evaluate condition and function and to determine if maintenance or repairs are warranted. In the case of regulated non-county facilities, follow-up actions include technical support to the BMP owner and, in some cases, enforcement.

Responsibilities Matrix

Task	DES CWP NPDES Mgr	DES CWP Admin	DES CWP Eng. Tech	PW Construction Management OA	PW Construction Management Supervisor	PW Construction Management Inspectors
Inspect Regulated Facilities	I	O	S	S	A	P
Inspect Facilities During Heaviest Home Construction	I	S	S	S	A	P
Inspect County-owned Facilities	I	O	S	S	A	P
Inspect Catch Basins	I	O	S	S	A	P

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Inspect Regulated Facilities

Regulated facilities are treatment and flow control facilities owned and operated by private parties and non-county governmental bodies. Clark County will annually inspect all regulated stormwater treatment and flow control facilities.

County responsibility for inspecting regulated facilities will begin at issuance of the completion of construction letter by Public Works Development Engineering. (See Regulatory Program for Development, Redevelopment, and Construction Projects on page 77.)

For facilities not in compliance with maintenance standards, the county will follow procedures to compel compliance through follow-up and enforcement actions if needed.

Track and Schedule Annual Inspections

Public Works Construction Management will use MMS to schedule and track regulated facility inspections.

Inspection

Inspections will be completed by Public Works Construction Management engineering technicians. The inspectors will compare facility condition with maintenance standards from *Stormwater Facility Maintenance Manual*.

Contact Owners of Non-Compliant Facilities

If an inspection shows that a facility is out of compliance, the inspectors will send a mailing to the owner(s) and/or responsible party. The mailing packet will include:

Regulated facility inspection *©Steven Lane/The Columbian*

- Introductory letter.
- Property identification.
- Postcard to return for technical assistance.
- Facility defect report.
- *Managing Stormwater Facilities* pamphlet with links to additional information..

Recipients will be referred to Construction Management for questions or problems.

Facility ownership or Homeowner Association leadership may change. In some cases, no viable Homeowner Association exists. Construction Management will refer these facilities to the Clean Water Program source control specialist.

Follow-Up Technical Assistance

The Construction Management inspectors will educate and assist owners who reply to the initial letter by giving advice on maintenance, including referrals to the City of Vancouver Small Works Roster for construction and maintenance companies. The assistance may include phone calls, additional correspondence and site visits. The inspector will facilitate compliance and use professional judgment to set deadlines for compliance activities.

Facilities that are not compliant after two 30-day notices will be referred to the Clean Water Program source control specialist for further action. At this point, the case is entered into *Tidemark* as a code enforcement case.

Further Enforcement

If the owner or owners of a non-compliant facility are unresponsive, then the source control specialist will refer the case to the code enforcement officer.

The code enforcement officer will use progressive enforcement methods, terminating with a Notice and Order and issuance of fines and liens in cases of severe non-compliance.

Alternate Compliance Strategy

The county retains the option of maintaining the facility and billing the owner at any point after an inspection demonstrates that a facility is out of compliance. The county rarely will exercise this option.

Compliance Tracking

Public Works Construction Management will update facility records in the MMS with compliance information on a regular basis, including inspection results, contact information and other relevant facility information. A spread sheet system tracks correspondence to regulated facility owners and assistance provided. Construction Management will also maintain paper files on all facilities.

Follow-up and enforcement actions will be tracked as paper files by the Clean Water source control specialist and entered into *Tidemark* as code enforcement cases.

Facility Ownership Transfer

While it rarely occurs, the county has a policy, criteria and procedures for accepting ownership of private stormwater facilities serving subdivisions. Facilities must meet county maintenance, safety and access standards before acceptance.

Inspect Facilities During Heaviest Home Construction

Clark County will inspect permanent stormwater treatment and flow control facilities, including catch basins, in new residential developments every six months during the period of heaviest construction. The county defines the period of heaviest construction as any time more than 50% of lots in a new subdivision have an open building permit. Current procedures are outlined below.

Create and Maintain Inspection List

The Clean Water Program office assistant will maintain a spreadsheet of potentially relevant subdivisions from *Tidemark*, including the number of lots in the subdivision and the number of lots having active building permits. The Clean Water Program office assistant will forward the list to the Clean Water Program code enforcement officer.

Research Facilities

The code enforcement officer will contact the Clean Water Program engineering technician for assistance if needed.

Schedule Inspections

The code enforcement officer will consult the spreadsheet monthly and schedule project sites requiring inspection for the following month. Any project having 50 percent or more lots with active building permits will be scheduled. The code enforcement officer will schedule future six-month inspections for each project using the spreadsheet.

Inspection

The code enforcement officer will inspect project sites using standards from the *Stormwater Facility Maintenance Manual* and fill out a paper field inspection sheet printed from the MMS.

Track Inspections

The code enforcement officer will update the spreadsheet with the date of the inspection and file the field inspection sheet and route the completed facility inspection form to Public Works Construction Management for entry into the MMS.

Enforcement

The method used to enforce maintenance compliance of a facility found to be out of compliance will depend on its ownership.

When a private facility is out of compliance, the code enforcement officer will use progressive enforcement. If follow-up actions do not elicit a response, or elicit a negative response, then further enforcement is employed.

When a county-owned facility on maintenance warranty is out of compliance, the code enforcement officer will refer the violation to the Public Works development inspector assigned to that development project..

When a county-owned facility is out of compliance, the code enforcement officer will refer the violation to the Public Works water quality crew chief for maintenance.

Inspect County-owned Facilities

The Clark County Public Works Construction Management Program annually will inspect all county-owned stormwater treatment and flow control facilities. Facilities with known problems may be spot-checked by Public Works Operations and Maintenance after significant storm events in addition to routine inspections.

- For county capital improvement projects, inspection responsibility will transfer to the county at the issuance of the final acceptance letter to the contractor by Public Works Construction Management.
- For facilities constructed as part of a private-sector development project, responsibility will transfer to the county at issuance of the completion of

construction letter to the developer. (See Regulatory Program for Development, Redevelopment, and Construction Projects on page 77.)

Inspection

Public Works Construction Management will inspect facilities annually using standards from the *Stormwater Facility Maintenance Manual*. Crews will note compliance and defects on paper field forms.

Spot Checks

After extreme storms, Public Works crews will inspect facilities that are on a list of facilities with known problems associated with heavy rainfall. The list also includes facilities that are monitored because of known problems associated with fall leaf drop.

Tracking

Public Works Construction Management office staff will enter inspection records from the paper field forms into MMS

Inspect and Clean Catch Basins

The Clark County Public Works Operations and Maintenance Program will inspect and clean catch basins in road right-of-way yearly on a circuit basis. Each catch basin is inspected and those exceeding sediment depth standards are scheduled for cleaning.

Catch basins in parks and other county facilities will be inspected and cleaned as part of routine maintenance by the custodial department.

Outputs

- Database entries of regulated facility inspections
- Updates to six-month inspection list
- Spot checks of public facilities after severe storms
- Catch basin cleaning
- Database entries of public facility inspections

Stormwater Facility and Class V Injection Control Well Maintenance

Purpose

Maintenance of stormwater facilities and stormwater disposal wells ensures that facilities continue to perform their important environmental and drainage functions. Clark County Public Works maintains most county stormwater infrastructure when it fails to meet a maintenance standard established by state guidelines and adopted by the county.

Responsibility for maintaining county-owned stormwater treatment and flow control facilities will begin at issuance of the final acceptance letter for those constructed as part of a county capital improvement and at the end of the maintenance warranty period for those built as part of a private-sector development project. (See Regulatory Program for Development, Redevelopment, and Construction Projects on page 77.)

The county does not maintain private stormwater facilities.

Responsibilities Matrix

Task	DES CWP Manager	DES CWP NPDES Mgr	DES CWP Eng. Tech	PW Road Ops Super	PW Ops Roads Crews
Routine Facility Maintenance	I	I	S	A	P
Non-routine Facility Maintenance	C	C	S	A	P
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted					

Typical Facility Maintenance

Clark County will perform routine maintenance, such as litter removal, mowing, and weed control, on swales, ponds, and filter strips that it owns. Typical maintenance is regular activities that maintain a facility's function that can be accomplished primarily with hand tools, lawn mowers, and weed whackers, and do not require engineering evaluation or heavy equipment. It does include cleaning sediment traps using vacuum trucks.

The following procedure applies to stormwater facilities maintained by Public Works, such as those in subdivisions and road right-of-way. Maintenance of other county stormwater facilities located in parks and on county campuses is covered in the section pertaining to operation of county lands (below).

Schedule and Prioritize

Most of the typical facility maintenance will occur during the growing season (April to September). The Clark County Public Works water quality crew chief will schedule the work based on atlas page and section.

Maintenance

Mowing grass and controlling weeds by weed whacking are the primary typical maintenance activities. Other maintenance for defects including sediment accumulation in sediment traps, minor erosion, presence of trees in pond or swale bottoms, etc., will be part of typical maintenance.

Capital Construction Facility Maintenance

Prioritization and Budget

The Clean Water Program and Public Works will develop an annual work plan for maintaining and repairing facilities that require capital construction under $25,000.

Individual maintenance projects estimated to cost more than $25,000 are referred to the Capital Planning Program (page 62).

Inspection Data Review

The Public Works NPDES road operations superintendent and crew chief will schedule facility maintenance requiring construction in consultation with the Clean Water Program manager and the NPDES permit coordinator.

Implementation

Maintenance requiring construction is accomplished as resources and weather permit within permit timelines.

Retrofit Program

Retrofits of stormwater facilities will be treated as stormwater capital projects (see County Stormwater Capital Projects on page 62 for more information).

Drywell Maintenance

Public Works Operations and Maintenance Roads crews will maintain drywells as necessary based on a visual inspection of defects.

Outputs

- Stormwater facilities maintained and repaired to meet county standards.
- Annual list of referrals to the capital planning program of facilities potentially requiring retrofit.
- List of projects referred to the capital planning program for repairs greater than $25,000.
- Database records of facility maintenance work.

Use of Water Quality BMPs during Roadway and County Property Operation and Maintenance

Purpose

Clark County maintains its properties and roadways in a manner that prevents or reduces stormwater impacts.

Responsibilities Matrix

Task	DES CWP Mgr	DES CWP NPDES Mgr	DES CWP Source Control Specialist	PW Ops Managers	PW Road Ops Super	PW Ops Roads Crews	PW Parks Super	PW Ops Parks Crews	DES Vegetation Mgmt. Mgr	DES Vegetation Mgmt. Crews	General Services, Facilities Mgr	General Services, Facilities Crews
Annually inspect and maintain catch basins in parks	I	I	O	A	O	O	A	P	O	O	O	O
Annually inspect and maintain catch basins on campuses	I	I	O	C	O	O	A	P	O	O	A	O
Road maintenance practices	I	I	O	A	C	P	O	O	O	O	O	O
Landscape maintenance on campuses	I	I	C	C	O	O	A	P	O	O	A	O
Landscape maintenance in parks	I	I	C	A	O	O	A	P	O	O	O	O
Noxious weed removal practices	I	I	C	O	O	O	O	O	A	P	O	O
Exterior building and grounds maintenance using good practices	I	I	C	O	O	O	O	O	O	O	A	P
Training road maintenance crews	I	S	S	A	A	P	O	O	O	O	O	O
Training parks maintenance crews	I	S	S	A	O	O	A	P	O	O	O	O
Training weed management crews	I	S	S	O	O	O	O	O	A	P	O	O
Training Facilities Maintenance crews	I	S	S	O	O	O	O	O	O	O	A	P
Develop SWPPPs for heavy equipment maintenance and storage yards	I	S	P	A	C	C	C	C	C	C	O	O
Check SWPPPs	I	S	O	A	O	P	O	O	O	O	O	O
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted												

Maintain Roadways and Sweep Streets

Road maintenance and operation will be conducted by the Public Works Operations and Maintenance program.

Clark County will maintain roadways and other traveled surfaces using pollution reduction practices defined by the ESA Regional Road Maintenance Program and in *Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property*.

Specific pollution-reduction activities will include:

- Routinely sweeping road surfaces to remove fines and to prevent first flush contamination.
- Periodic removal of litter from conveyances, such as ditches.
- Annual catch basin cleaning.

Practices to prevent pollution will be implemented for the following maintenance activities:

- Pipe cleaning.
- Culvert cleaning.
- Ditch maintenance.
- Street cleaning.
- Road repair and resurfacing, including pavement grinding.
- Snow and ice control.
- Utility installation.
- Maintaining roadside areas, including vegetation management.
- Dust control.
- Pavement striping maintenance.

Maintain Parks

Parks may contain any or all of the following types of land cover: pavement, landscaped areas, natural areas, structures, and stormwater facilities. Parks will be maintained by Public Works Operations and Maintenance, Parks program.

Clark County will maintain park vegetation and structures according to *Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property* and the *Clark County Stormwater Pollution Control Manual* and current pesticide application rules. Pesticides will be purchased according to the county's Environmentally Responsible Purchasing Policy. Parks maintenance crew members are trained under the ESA Regional Forum and are state licensed pesticide operators.

Parks crews will inspect catch basins within parks during routine park maintenance and will clean them as needed.

Parks crews will inspect stormwater facilities within parks annually according to the *Stormwater Facility Maintenance Manual*.

Parks crews will mow and remove litter from stormwater facilities within parks frequently during routine park maintenance. Public Works Road Operations will provide the balance of the maintenance.

Maintain County Property

County campuses are managed by the General Services department. General Services personnel maintain pavement and building exteriors; General Services has an agreement with Public Works Operations and Maintenance, Parks program for most outdoor vegetation management activities.

Clark County will maintain landscaping and hard surfaces on its campuses according to the *Clark County Pollution Control Manual* and as appropriate, the *Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property*. Pesticides will be purchased according to the county's Environmentally Responsible Purchasing Policy. Parks maintenance crew members are trained under the ESA Regional Forum and are state licensed pesticide operators.

Parks crews will inspect and maintain catch basins on county campuses as needed.

Parks crews will mow and remove litter from stormwater facilities on county campuses as needed based on visual inspection.

Clark County keeps a Stormwater Pollution Prevention Plan (SWPPP) for each of its seven heavy equipment and materials storage yards, operated by Public Works. Copies of the SWPPPs are kept at each site. The Public Works Operations and Maintenance safety officer will visually inspect and enforce the source control BMPs at each yard.

Control Weeds on County Property

State regulated noxious weed control on all county properties is provided by the Environmental Services, Vegetation Management program.

Clark County will control weeds according to the *Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property* and current pesticide application rules. Pesticides will be purchased and used according to the county's Environmentally Responsible Purchasing Policy.

Vegetation Management field crews are state licensed pesticide operators.

For some areas, such as mitigated wetlands and properties with legacy lands designation, Vegetation Management will compose a Site Specific Plan to ensure that compliance with all environmental regulatory requirements, including NPDES permit requirements, will be achieved.

Employee Training

Crews from both Public Works Operations and Maintenance and Environmental Services Vegetation Management have been trained under the ESA Regional Road Maintenance tracks 2 and 3. Track 2 coursework describes the biology of endangered fish and how road and park maintenance activities can harm them; it is generally provided to supervisors and managers. Track 3 provides crew chiefs and crew members with maintenance guidelines and procedures to protect endangered species during maintenance work. Staff attended the program at the University of Washington T2 Training Center.

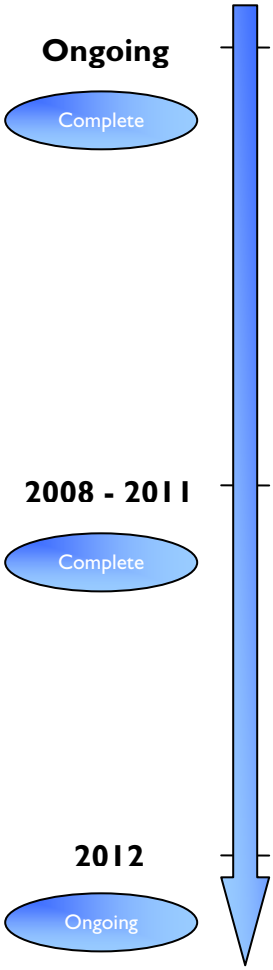
Train New Personnel

Clark County Public Works will provide ESA Regional Road Maintenance training using an approved vendor for new or promoted staff, as necessary.

Outputs

- Street sweeping
- Litter removal
- Maintenance of county property using proper BMP manuals
- Employee training
- Stormwater Pollution Prevention Plan at each heavy equipment and storage yard

TIMELINE



- ✔ Spot check facilities with known problems after major storms
- ✔ Annually inspect and clean, if needed, county-owned catch basins
- ✔ Establish practices to reduce stormwater impacts from county road maintenance activities
- ✔ Establish practices to reduce stormwater impacts from property and landscape maintenance activities for county property
- ✔ Employee training
- ✔ Develop SWPPPs for county equipment yards

- ✔ Adopt maintenance and implement standards equivalent to the SMMWW
- ✔ Require maintenance of regulated facilities to the SMMWW
- ✔ Inspect all regulated facilities at least once during the permit term
- ✔ Inspect all new facilities in new residential developments every 6 months during the period of heaviest construction
- ✔ Inspect all county-owned facilities annually

- ❑ Program to annually inspect all regulated facilities

FOR MORE INFORMATION ON COUNTY OPERATION AND MAINTENANCE OF THE MS4

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Section 4
Detecting and Reducing Pollutants and Contamination

Contaminants may enter the MS4 through improper connections and through discharge of contaminants from sites with private storm systems that are connected to the MS4. Eliminating improper connections and reducing the discharge of contaminants is an important part of the county's Stormwater Management Program.

Improper connections may be discovered through routine screening of the system, site inspections or by complaint. When an improper connection is discovered, removal and disconnection are high priorities.

Regular and wide-spread inspections of business and multi-family sites helps ensure that sites are properly managing potential contaminants, maintaining catch basins and conveyance systems, and preventing non-stormwater discharges into their private systems that discharge to the MS4. Above NPDES Permit requirements, the program also addresses sources that may not discharge to the MS4, including discharges to Class V injection wells and private conveyance to surface water.

Source Control Program

Regulatory Requirements Summary

NPDES Permit S5.C.7 – Source Control Program for Existing Development

The NPDES Permit requires the county to reduce pollutants in runoff from areas that discharge to the MS4 by applying operational, structural source control, and treatment Best Management Practices (BMPs); enforcing proper BMPs on commercial, industrial and multifamily properties; enforcing water quality ordinances; and reducing pollutants from pesticides, herbicides and fertilizers entering the MS4.

Stormwater Management Manual for Western Washington

Volume IV of the *SMMWW* contains technical guidance for source control BMPs.

County Policies, Rules and Regulations

Clark County Code Chapter 40.385 – Stormwater and Erosion Control

Chapter 40.385 adopts the *Clark County Stormwater Manual* as the technical manual for meeting the Minimum Requirements of the *SMMWW*, including minimum requirement 3, Source Control of Pollution.

Clark County Code Chapter 13.26A – Water Quality

Clark County prohibits non-stormwater discharges to the MS4 and regulates the discharge of contaminants to surface water, stormwater, and groundwater to protect the county's surface and groundwater quality. The code and manual provide minimum requirements for reducing and controlling the discharge of contaminants by requiring all sites and activities to utilize source control Best Management Practices (BMPs) to control release of contaminants.

Chapter 13.26A also adopts the *Clark County Stormwater Pollution Control Manual* that provides BMPs for materials handling, landscape management, trash management, and building exterior maintenance.

Clark County Stormwater Manual

The *Clark County Stormwater Manual* contains technical guidance for meeting county stormwater code when developing, redeveloping,

or constructing buildings on a site. It directs users to consult the *Clark County Stormwater Pollution Control Manual* to fulfill minimum requirement 3, Source Control of Pollution.

Clark County Stormwater Pollution Control Manual

The *Clark County Stormwater Pollution Control Manual: Best Management Practices for Businesses and Government Agencies* adopts source control and treatment standards for public and private properties equivalent to Volume IV of the SMMWW.

Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property

Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property provides water quality and vegetation management practices for county maintenance crews pursuant to Chapter 13.26A. The manual was adopted for county use by directive of the County Administrator.

Inventory Potential Pollutant Generating Sites

Purpose

The inventory helps target education and enforcement of source control requirements on commercial, industrial, and multifamily sites.

Responsibilities Matrix

Task	CWP Source Control Specialist	CWP GIS Analyst	NPDES Coordinator
Create inventory of tax lots by type	S	P	A
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted			

Inventory Creation

The Clean Water Program used the Clean Water Fee database to identify commercial, industrial, and multifamily sites in the county that have impervious surfaces.

The database is derived from the Clark County Assessor tax lot database and a GIS overlay of impervious surfaces. It includes parcel owner, site address, owner's mailing address, square footage of impervious surface, and the primary land use code. As inspections have progressed to include most permanent business sites, a separate, inspection-based site inventory is maintained in the *Tidemark* inspection and enforcement tracking database.

Outputs

- Inventory of business and multifamily sites

Source Control at Business and Multifamily Sites

Purpose

Clark County inspects businesses and larger multifamily sites for compliance with source control requirements to ensure pollutants are not discharged to the MS4 or groundwater via Class V stormwater infiltration wells.

Responsibilities Matrix

Task	DES CWP Manager	DES Source Control Specialist	DES Code Enforcement Officer	PW Development Inspectors	DES Office Assistant
Site selection	A	P	O	O	O
Inspection / education	A	S	S	P	O
Follow-up for compliance	A	S	P	S	O
Referral	A	P	P	S	O
Record-keeping	A	S	P	S	P

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Site Selection

Each year, all business sites within selected subwatersheds will be inspected. Selection of subwatersheds will coincide with the Stormwater Needs Assessment Program (SNAP) schedule (page 129). In years when SNAP does not perform subwatershed-specific assessments, the least recently visited sites will be selected.

Inspection and Education

Inspections are conducted by qualified county staff. Currently, Public Works Engineering Program development inspectors inspect sites, with assistance provided by the Environmental Services source control specialist.

At each business site, county staff will approach the owner, manager, or other employees to obtain access to the storm system on the site and to ask questions about source control practices and, if relevant, structural source control BMPs.

Staff will note inspection findings on the "Clark County Stormwater Business Site Visit Report" field form.

During the visit, county staff will provide education and technical assistance as judged necessary or beneficial. Education or assistance could include brochures, BMP handouts, general information on stormwater pollution topics, copies of the county's water quality ordinance, *Clark County Stormwater Pollution Control Manual: Best Management Practices for Businesses and Government Agencies*, or referrals to maintenance companies.

Follow-up Actions for Compliance

If a business is not in compliance, the source control specialist or the development inspector will work with the manager or owner to reach compliance. Follow-up actions may include phone calls, additional site visits, and letters. County staff may give additional technical assistance such as locating engineering drawings, providing handouts from the *Clark County Stormwater Pollution Control Manual: Best Practices for Businesses and Government Agencies*, and recommending new source control BMPs.

The source control specialist will assist the development inspector in gaining compliance in difficult cases.

The development inspector or the source control specialist will set deadlines as necessary for compliance actions (e.g. cleaning catch basins). If the site has a stormwater treatment facility that appears to need maintenance, he will refer the site to the Clean Water Program source control specialist for follow-up.

Follow-up actions will also be recorded on the "Clark County Stormwater Business Site Visit Report" field form.

Referral

If necessary to gain compliance, the source control specialist will refer the case to another agency such as Clark County Public Health or the Clark Regional Wastewater District.

The source control specialist will continue to follow the case to conclusion.

Further Enforcement Actions

Further enforcement will be provided by Clean

Water Program Code Enforcement or by referral to Ecology in cases of continued inaction.

Record-keeping

Data from field forms for both inspection and follow-up will be entered into *Tidemark* as a SWI2009 case by an Environmental Services Clean Water Program office assistant.

Outputs

- Records of inspections and follow-up cases in *Tidemark*
- Report of numbers of inspections and referrals
- Case files

Source Control Success

In summer 2010, development inspector Forest Shuler completed a routine source control inspection at the operations center of the county's residential waste hauler, Waste Connections, Inc. Employees there use a concrete pad to wash dumpsters and garbage trucks, generating hundreds of gallons of soapy, greasy water daily. Forest suspected that dirty wash water ended up in the nearby bioswale, intended solely for stormwater.

The Clean Water Program's source control specialist, Cary Armstrong, called in Clark Regional Wastewater District (CRWWD) to determine the dirty wash water's path. As Forest had suspected, it ended up in the nearby bioswale. In addition, the wash water had filled the parking lot's oil/water separator with grit, causing damage to the connected swale.

New covered wash pad

Clark County and CRWWD required the company to cover the wash pad; direct the wash water to sanitary sewer; clean the oil/water separator; and clean, re-grade, and replant the damaged bioswale. Under skilled direction from Public Works private facility inspector Rich Wanke, Waste Connections complied with all requirements. Work was completed in January 2011.

Water Quality Complaint Investigation

Purpose

Clark County investigates complaints about water quality problems to reduce contamination of stormwater, surface water, and groundwater as well as to comply with its NPDES Permit.

Responsibilities Matrix

Task	DES CWP Manager	DES Source Control Specialist	DES Office Assistant
Open case	A	P	O
Investigation	A	P	O
Education and compliance	A	P	O
Record-keeping	A	S	P

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Open Case

Water quality complaints may arrive in a variety of ways, including the 24-hour water quality complaint line, referral from other agencies, e-mail to the Clean Water Program general address, and phone calls to the Clean Water Program. Complaints may be made by the general public or agency staff.

Complaints will be referred or forwarded to the Environmental Services Clean Water Program source control specialist.

Investigation

The source control specialist will investigate every legitimate complaint beginning with a phone call and site visit.

For business sites, the specialist will fill out the "Clark County Stormwater Business Site Visit Report" field form and begin a case file.

For residential sites, the specialist will fill out the field form but generally will not begin a case file. In difficult or egregious cases, the specialist will begin a case file.

Education and Compliance

If a water quality or source control violation is found, the specialist will work with the property owner on compliance or refer the case to another agency, generally following the procedures for source control follow-up (above), and, if necessary, further enforcement actions.

Record-keeping

A Clean Water Program office assistant will enter data from the field forms into *Tidemark* as a SWI2009 case. The specialist will keep any case files.

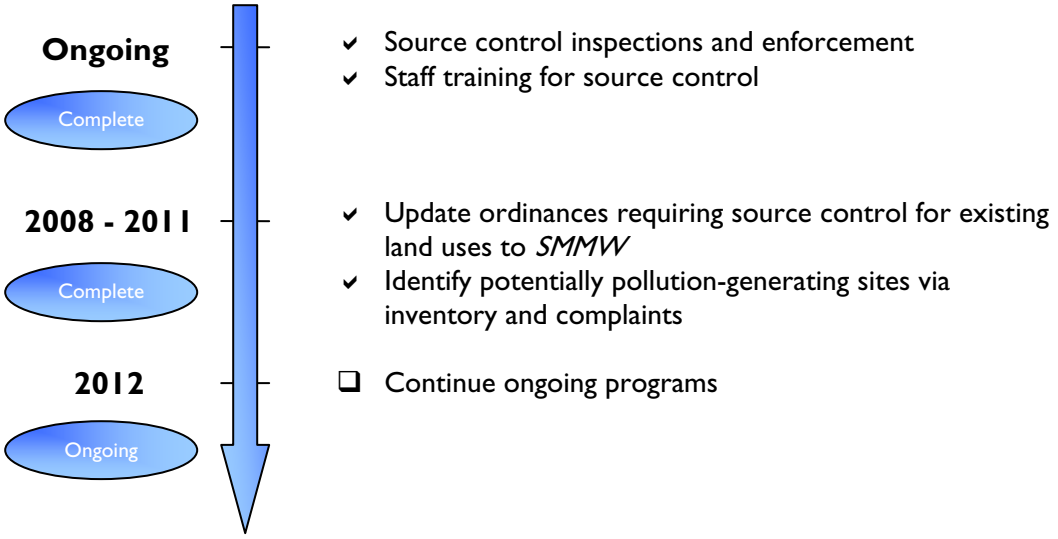
Outputs

- Records of complaints, investigations and follow-up in *Tidemark*
- Case files

TRAINING

Clean Water Program and Code Enforcement personnel have been performing source control inspections and enforcement since 2000. When applicable, new staff will be trained on enforcing the Water Quality Ordinance, including legal basis, BMPs, inspection procedures, enforcement process, and record keeping. When changes to manuals or procedures are made, all appropriate staff will be trained .

TIMELINE



FOR MORE INFORMATION ON THE SOURCE CONTROL PROGRAM

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Illicit Connections and Illicit Discharges Detection and Elimination (IDDE)

Regulatory Requirements Summary

NPDES Permit S5.C.8 – Illicit Connections and Illicit Discharges Detection and Elimination

The NPDES Permit requires the county to have a program to detect, remove, and prevent illicit connections and illicit discharges, including spills, into the MS4. Illicit connections are man-made conveyances connected to the MS4 without a permit, such as sanitary sewers and floor drains, that can carry materials other than stormwater. Illicit discharges are discharges to the MS4 not composed entirely of storm water, except where allowed by a state waste discharge permit.

The Permit designates timelines for beginning an investigation of a suspected illicit connection and for terminating a confirmed illicit connection.

Revised Code of Washington Chapter 90.48 – State Water Pollution Control Act

The State Water Pollution Control Act prohibits the discharge of contaminants to waters of the state.

County Policies, Rules and Regulations

Clark County Code Chapter 13.26A – Water Quality

Chapter 13.26A prohibits the discharge of contaminants into surface water, stormwater, or groundwater, and it defines contaminants and illicit connections. It gives inspection and enforcement authority to authorized representatives of the Environmental Services Director or other department heads specified in established procedures to enforce that chapter.

Clark County Code Chapter 13.10 – Use of Sewer

Chapter 13.10 requires the use of sewers to dispose of liquid wastes and water carrying waste materials.

Clark County NPDES Illicit Discharge Detection and Elimination Screening Quality Assurance Project Plan

The Project Plan addresses project design, schedule, methods of data collection and management, quality assurance and control requirements, data analysis, thresholds for further investigation, and reporting for the county's program to screen the MS4 for illicit connections.

Illicit Connection Screening

Purpose

Screening for evidence of illicit connections helps county staff identify outfalls or points in the MS4 that appear to convey something other than stormwater, as well as meeting Permit requirements for ongoing screening.

Responsibilities Matrix

Task	DES CWP Manager	DES Natural Resources Specialist	PW Ops Field Staff (TBD)
Basin selection	A	P	I
Outfall selection	A	I	P
Site visits / screening	A	I	P
Sampling / evaluation	A	P	I
Record-keeping	A	P	O
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted			

Ongoing Work

Clark County carried out an extensive screening program in 2006, 2007, and 2008, meeting the NPDES Permit requirement to screen at least half of the conveyance systems in the high density area and at least one rural sub-basin during the permit term.

Environmental Services Clean Water Program natural resources specialists (NRS) will continue effectiveness monitoring on illicit connections discovered during previous field screening operations (see Illicit Connection and Discharge Response and Removal on page 55). In addition, an NRS or the source control specialist will respond to any complaints and referrals.

Source control inspections are ongoing (see Source Control Program on page 45).

Basin Selection

A Clean Water Program NRS will select subwatersheds for screening based on professional judgment and watershed management objectives. In some years, IDDE work may be very limited.

Outfall Selection and Scheduling

A Clean Water Program NRS will use the county stormwater infrastructure inventory GIS database, *StormwaterClk*, to locate and map all outfalls within chosen basins. Staff will schedule site visits using this information.

Site Visits

During dry weather, a NRS will screen outfalls for indicators of illicit connections, such as flow or deposits.

Sampling and Evaluation

The NRS will take samples at flowing outfalls, send them for laboratory analysis, and then evaluate the results using defined protocols to determine if an investigation is warranted. In cases where an investigation is warranted, the discharge is called a suspected illicit discharge or connection.

Investigations and follow-ups are part of the Illicit Connections and Discharge Response program (below).

Record-keeping

The NRS will track all information regarding screening, illicit connection investigations and response to illicit discharges if applicable, in the IDDE screening database.

Outputs

- Records in the IDDE screening database
- Annual written summary of screening activities, investigations and results (may be stand-alone or incorporated in Stormwater Needs Assessment Program reports)
- Report of number of inspections and follow-ups
- Laboratory data and field measurements entered in the *Water Quality Database*

Illicit Connection and Discharge Response and Removal

Purpose

Clark County responds to all suspected illicit discharges and connections to the MS4 that it identifies through screening or other methods. Response is designed to eliminate the source of the discharge or the connection.

Responsibilities Matrix

Task	DES CWP Manager	DES Natural Resources Specialist	DES Source Control Specialist	Public Health	CRWWD	Ecology
Open case	A	I	P	O	O	O
Investigation	A	S	P	S	S	S
Follow-up / removal	A	I	P	S	S	S
Continued follow-up	A	S	P	S	S	S
Record-keeping	A	P	S	O	O	O
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted						

Suspected Illicit Connection and Discharge Response

The DES Clean Water Program and Public Works most frequently will receive and respond to reports of suspected illicit connections; however, some illicit connections of on-site sewage treatment systems are discovered and terminated by Clark County Public Health. The process described here is that used by the Clean Water Program and Public Works.

Notify Ecology of Severe Threats

The county immediately will notify Ecology if an illicit discharge or connection poses a severe threat to human health or the environment.

Open Case

The process begins with notification about a suspected illicit discharge or connection through referral from illicit detection screening (above), discovery through source control inspections (above), or complaint.

The source control specialist will open a case file.

Investigation

Within 21 days, the Clean Water Program source control specialist and a NRS will attempt to trace a suspected illicit discharge or connection back to its source to identify

the problem. If tracing back to the source is not possible, they may elect to follow other protocols established in the IDDE Project Plan.

The source control specialist will confirm or deny the presence of the suspected illicit discharge or connection based on the findings, and, when possible, will specify the source.

Follow-up and Removal

For confirmed illicit discharges or connections, the source control specialist will work with the property owner and, if necessary, other county departments or agencies to eliminate the illicit connection. If relevant, Clark Regional Wastewater District, Public Health, cities, or the Department of Ecology may be requested to assist in areas where they have responsibility.

Addressing illicit discharges will follow standard source control procedures for follow-up actions (e.g. personal contacts) and further enforcement by a Code Enforcement Officer, if necessary.

Removal of illicit connections will be completed within six months of confirmation of an illicit connection through field verification.

Continued Follow-up

Following the IDDE Project Plan, questionable outfalls require continued follow up, which may include effectiveness monitoring at sites where illicit connections or discharges were found, repeat screening where low levels of pollutants were found, or additional visits by the source control specialist to verify that actions leading to an illicit discharge are ended.

Record-keeping

The source control specialist will inform the NRS of the results of the follow-up actions involving illicit discharge or connection abatement. The NRS will enter information into the IDDE screening database.

If the case is a suspected illicit connection, the date it was first discovered or reported will be used to track the requirement to initiate an investigation with 21 days.

After the illicit connection is confirmed, the requirement to terminate the connection within six-months will apply. If the suspected connection was identified through field

observation, source control inspection, or complaint, the discovery date is the date the observation or complaint was made. If the suspected connection was identified through laboratory analysis, the discovery date is the date of the official laboratory report. Discovery dates will be recorded and tracked in the IDDE screening database.

A record is kept for every illicit connection referred to Ecology as a severe threat to human health or the environment.

Outputs

- Removal of illicit connections and reduction of illicit discharges to the MS4
- Entries in the IDDE screening database
- Reporting to Ecology

Spill Response

Clark County responds to spills on surfaces, such as roadways, that discharge to the MS4, surface water, or ground water, and to improper dumping into the MS4.

Purpose

The purpose is to reduce and prevent contamination of surface water and stormwater.

Responsibilities Matrix

Task	PW Operations Admin	PW Operations Crew Chief	PW Operations Road Crew	PW Operations OA
Open case	I	A	P	I
Spill response / clean-up	I	A	P	I
Notify Ecology	A	P	S	O
Record-keeping	A	S	O	P
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted				

Notification

Spill notification can arrive in a variety of ways, including detection by Public Works Operations and Maintenance roads crews or citizen complaint.

Clark County staff receiving notification of a spill will immediately notify Public Works Operations and Maintenance dispatch. County personnel also will immediately refer significant spills to Department of Ecology.

Response

A Public Works Operations and Maintenance roads crew will be called out to handle spills

such as automotive fluid on roadways.

For urgent complaints arriving after hours via telephone, the answering service will page the Public Works Operations and Maintenance on-call crew chief, who will determine the level of response following established Public Works guidelines.

Record-keeping

Records of spill incidents and responses will be kept in the Public Works customer service database.

Outputs

- Spill clean-up
- Records of incidents responses

Water Quality Problem Reporting Line

Purpose

Clark County advertises its 24-hour Public Works customer service line as a water quality complaint line. The line gives citizens an opportunity to report spills, dumping, and other water quality concerns at any time.

Responsibilities Matrix

Task	PW Operations Admin	PW Operations OA	PW Answering Service
Take calls during business hours	A	P	O
Take calls after hours	A	I	P
Dispatch	A	P	P
Log calls in database	A	P	O
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted			

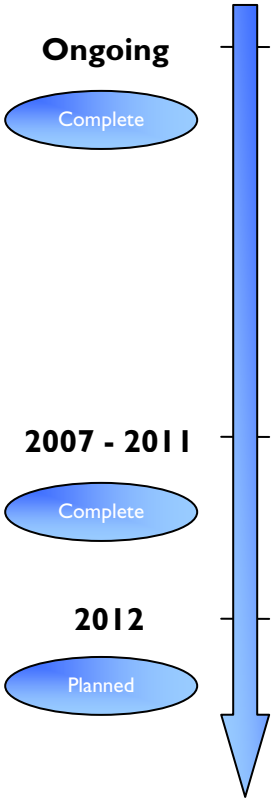
Complaint and Dispatch

Complaints arriving on the line are logged to the Public Works customer service database by Public Works office assistants. Incidents are dispatched to appropriate county personnel or Department of Ecology, depending upon the nature of the incident, and then handled following established procedures for the type of problem.

Outputs

- Report of number of calls to the general customer service line

TIMELINE



- ✔ Continue implementing on-going program to prevent, identify and respond to illicit connections and illicit discharges
- ✔ Procedures for addressing pollutants entering the MS4 from interconnected MS4s
- ✔ Staff training
- ✔ Continue ongoing program to screen for illicit connections
- ✔ Respond to illicit connections
- ✔ Implement procedures to respond to spills

- ✔ Update ordinances to prohibit new categories of non-stormwater discharges
- ✔ Operate a water quality citizen complaint line

- ❑ Continue ongoing programs

FOR MORE INFORMATION ON THE COUNTY PROGRAM TO DETECT AND ELIMINATE ILLICIT CONNECTIONS AND DISCHARGES TO THE MS4

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Section 5
Expanding and Improving the Stormwater Management Infrastructure

As the county grows and as impacts of runoff on surface water are better understood, the primary means of controlling runoff from areas of new growth and for fixing problems caused by uncontrolled runoff from existing developed areas is by expanding and improving the stormwater management infrastructure.

In Clark County, stormwater management infrastructure is expanded in three ways:

County Stormwater Capital Improvement Projects

The county has a program to plan and construct new stormwater infrastructure and improve existing infrastructure to better control and treat runoff from areas where existing development does not include stormwater controls. This addresses the permit requirement to mitigate for stormwater impacts from existing development.

Development and Redevelopment Flow Restoration Projects

The county constructs new or upgrades existing stormwater flow control facilities to provide flow control for development projects that do not restore flow duration on site to match forested conditions.

Regulation of Development, Redevelopment, and Construction Projects

Private entities develop the land, and the county regulates the design and construction of stormwater controls on it, many of which eventually become part of the county's own stormwater infrastructure.

The process for each of these types of projects is described below.

Roadway flooding during winter storm, 2007

County Stormwater Capital Improvements

Many past stormwater management and drainage practices and regulation have proven inadequate to prevent impacts of runoff on surface water, and thousands of developed acres in Clark County contribute to problems in streams, lakes, and rivers. Accordingly, the county has a program to construct stormwater capital improvements primarily to control and treat stormwater from areas of existing development with inadequate stormwater controls. In addition, the county may take opportunities to expand the treatment and control capacity of existing facilities when making repairs. These activities all are part of the county's stormwater capital improvement program, described here.

Regulatory Requirements Summary

NPDES Permit – S5.C.6. Structural Stormwater Controls

The NPDES Permit requires the county to have a program to construct structural stormwater controls to prevent or reduce impacts to waters of the state caused by discharges from the municipal separate storm sewer system, often referred to as the MS4. Projects include flow control facilities, water quality treatment facilities, facilities to trap sediment, retrofits of existing facilities, and property acquisition to provide water quality or flow control benefits. Other means to reduce impacts include riparian habitat acquisition and restoration of forest in upland areas and in riparian buffers.

While the permit requires a structural stormwater control program, it does not prescribe a scope for it other than to note that the program will demonstrate it meets AKART and MEP standards.

The SWMP must include a list of planned individual projects updated in each annual report to the state.

The description of the structural stormwater control program in the SWMP must include the program's goals and the planning process, including budget and public involvement. Individual project descriptions must include estimated pollutant load reduction (if applicable), flow control benefits (if applicable), other expected environmental benefits, and plans for monitoring the facility.

A table describing the 2007-2013 capital projects is attached as Appendix A.

Chapter 173-218 WAC – Underground Injection Control (UIC) Program

Pursuant to Chapter 90.48 RCW, the state's requirements for stormwater infiltration wells may drive capital improvements if the county finds systems that pose a threat to groundwater.

County Policies, Rules and Regulations

The Clean Water Program has the following policies for county stormwater capital improvements:

- Meet NPDES Permit requirements for the structural stormwater control program through stormwater capital planning and capital construction.
- Meet obligations to control flow durations to forested conditions for development and redevelopment under the terms of an Agreed Order with Ecology (see Development and Redevelopment Flow Restoration Program, below).

County goals for stormwater capital improvements include:

- Protect and enhance streams and wetlands in Clark County through planning and constructing modifications to the stormwater infrastructure.
- Minimize the degradation of receiving waters from impacts attributable to stormwater runoff in existing developed areas.
- Maximize public benefits of county-owned land by providing multiple uses, including recreation, and by leveraging funding from multiple sources.
- Provide stormwater facilities for future development and redevelopment.

As-Built Plan Preparation

Clark County Public Works follows a management practice for the production of record drawings at the final acceptance of a public capital project.

Stormwater Capital Planning

Purpose

Planning ensures that stormwater capital improvements meet the county's goals.

Capital planning is a process for identifying potential projects, deciding if they are feasible, selecting the best for further development, and tracking their progress from inception through construction. The capital plan will list projects scheduled for implementation on a three-year horizon.

- The proposed projects are considered to comply with MEP and AKART requirements under Permit Condition S5.C.6.
- Projects reflect what Clark County is best able to implement within its available funding and demands for structural control projects.
- Projects address stormwater impacts not adequately controlled by other permit-required actions, chiefly those caused by uncontrolled or untreated runoff from existing development, and habitat degradation that has already occurred.

By complying with permit condition S5.C.6., together with all of the remaining other permit requirements, Clark County complies with MEP and AKART as set forth in the county's NPDES Municipal Stormwater Permit condition S4.E.

Individually, projects meet AKART by being designed following practices described in the *Stormwater Management Manual for Western Washington*.

The capital plan considers projects within the entire unincorporated urban and rural Clark County, but focuses on the urban and urbanizing area where stormwater impacts are greatest.

Development and Redevelopment Flow Restoration Projects

Along with identifying projects to address the NPDES Permit's structural controls requirement, stormwater capital planning also selects projects suitable for meeting the needs of the Development and Redevelopment Flow Restoration Program.

Responsibilities Matrix

Task	DES CWP Program Manager	DES CWP Engineer	PW Eng. Program Manager	PW Eng. Project Manager	PW Eng. Program Staff	BOCC	DES Director
Accept referrals	A	P	O	O	O	O	O
ID potential projects	A	P	O	O	S	O	O
Database entry & updates	A	P	O	O	O	O	O
List of potential projects	A	P	I	I	C	O	O
Formulate selection criteria	A	P	I	O	S	C	C
Apply selection criteria	A	P	C	C	S	O	C
Annual list of projects	A	P	S	S	S	I	C
Scoping and Selection	A	P	O	O	S	O	I
Three-year capital plan	A	P	C	S	S	C	C
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted							

Referrals

Each year, dozens of project ideas will be referred to the Clean Water Program from

several sources, primarily the Stormwater Needs Assessment Program (SNAP) (see page 129). CWP engineers also will review existing watershed plans and water quality reports to identify project ideas and establish specific project basis, such as addressing a water quality concern or reducing streambank erosion. Other sources will be existing knowledge of engineers, problems identified by Road Operations crews, and projects suggested by the public.

Referrals can arrive continuously throughout the year, with the greatest number occurring as the annual SNAP cycle completes.

Referrals may or may not result in feasible capital improvements. CWP engineers and scientists will evaluate referrals to determine if further consideration is warranted, using selection criteria for project feasibility, environmental benefit and public safety.

Project Tracking / Capital Planning Database

CWP engineers will enter potential capital projects selected for further consideration into the *Capital Planning Database* as they are evaluated.

The database tracks stormwater capital projects from inception to construction and close-out, or their status as shelved or dropped including the following attributes:

- Project category/type.
- Description and basis of the project and the problem being addressed.
- Estimated project benefits including flow control, pollutant load reduction, habitat enhancements, and other environmental benefits.
- Status of preliminary engineering and construction.
- Funding summary.
- Types of potential environmental impacts, including wetland, priority habitat, cultural resource, floodplain impacts, etc.
- Development and Redevelopment Flow Restoration Program reporting data.

As projects advance and more information is developed, CWP engineers will update the database with new details on a regular basis.

List of Potential Projects

Using professional judgment and broad selection criteria, CWP engineers will select candidate projects from the database each year to form an annual list of projects to promote to the Stormwater Capital Improvement Program (SCIP). Selection criteria will reflect program priorities and goals, and will consider the projected capital budget for the coming year, ratio of project types in the existing plan, project schedules and feasibility, and emphasis on particular watersheds.

Information describing the conditions and stormwater needs or problems in each subwatershed is contained in the Stormwater Needs Assessment Program reports. These reports are the primary source of information to identify projects for review and consideration on the annual potential project list.

Engineers and Clean Water Program NRSs will describe a project basis that lists the primary project type, objective, and a description of the problems the project will address.

Scoping and Final Selection

Scoping and final selection is a task to review projects on the annual list and to select a set to be designed through the capital program.

In scoping, CWP engineers will initially analyze projects from the annual list for consideration in the capital plan. They will define the project in more detail, look for fatal flaws in engineering or environmental permitting, create a rough grading plan, estimate flow control and water quality benefits, and preliminarily assess cost-benefit. If necessary, engineers will analyze alternatives.

As projects are scoped, CWP engineers will update the *Capital Planning Database* with new information.

Using professional judgment, CWP engineers and mangers will select a set of scoped projects for advancement to the capital plan. Criteria considered will include cost-benefit, feasibility and schedule, project basis and need, and the availability of funding and leveraging opportunities.

Three-Year Capital Plan

Each year, CWP engineers will update a three-year capital plan. The plan will list large capital projects, small construction projects, and repairs of existing facilities costing greater than $25,000. The plan also will describe expected benefits and outcomes of the projects and will include an expected schedule.

The plan will include a mix of structural stormwater controls projects meeting NPDES Permit component S5.C.6, stormwater flow restoration projects (see below), and large facility maintenance projects.

Outputs

- Database entries of potential projects and scoped projects, and detailed project attributes, for consideration in subsequent years
- Annual list of potential projects
- Scoping reports for projects on the annual list
- Alternatives analyses for the scoped projects
- Recommendations for promotion to the three-year capital plan
- Three-year capital plan with funding allocation

Construction of the Curtin Creek Enhancement Area

Capital Project Construction Program

Purpose

The construction program is the engine for designing, permitting, and building stormwater capital projects. The Public Works Engineering Program leads the effort through established project management systems.

Responsibilities Matrix

Task	DES CWP Prog. Manager	DES CWP Engineer	DES Enhancement & Permitting Mgr.	DES Env. Permitting Coordinator	PW Eng. Program Manager	PW Eng. Project Manage-ment Manager	PW Eng. Project Manager	PW Eng. Program Engineers	PW Eng. Construction Manager	PW Eng. Construction Mgmt. Staff
Assign Project Team	I	I	S	S	A	P	S	S	S	S
Schedule and Budget	S	S	S	S	A	C	P	S	S	S
Preliminary Engineering	I	O	O	O	A	S	S	P	O	O
Permitting	I	O	A	P	I	O	I	C	C	O
Construction Management	I	I	I	C	I	S	S	C	A	P
Project Close Out	I	S	I	C	A	I	P	C	C	C
Calculate Flow Control Metrics	A	P	O	O	O	O	C	C	O	O
Update Capital Planning Database	A	P	O	O	O	O	O	O	O	O

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

The Public Works Engineering Program designs and oversees construction of all types of capital improvement projects, including county stormwater projects. Their services include project management, survey, property acquisition, engineering, and construction management.

The program is responsible for the advancement of stormwater capital projects from the three-year capital plan to construction. The responsibilities and procedures for this program are briefly reviewed below.

Team, Schedule, and Budget

From the three-year capital plan, the manager of the Project Management section will assign a team of professionals led by a project manager to each project.

The project manager, with the help of the team, will develop a detailed scope, schedule and budget for his/her assigned projects. The project manager will monitor each item closely throughout each project's life.

Preliminary Engineering and Environmental Permitting

Public Works engineers will create engineering plans, design specifications, and cost estimates for each project in the plan. Department of Environmental Services permitting coordinators will shepherd each project through local, state, and federal permitting processes.

NE 152nd & 20th Avenue Stormwater Facility Retrofit

As projects near completion of engineering design, the Engineering Program manager, in consultation with the Clean Water Program manager, will make the final decision to advance selected projects to construction.

Bid

The project manager will coordinate with the Clean Water Program and the team to prepare and execute a project bid schedule.

Construction Management

The Public Works Engineering Program Construction Management team will review bids and prepare an award recommendation for the Board of Clark County Commissioners.

Once the contract is awarded, Construction Management will administer it and oversee construction.

As a project reaches completion, the construction manager will send a copy of the letter of physical completion to the Clean Water Program and Public Works Operations and Maintenance program. The Clean Water Program also will be copied on the letter of final acceptance.

Receipt of the physical completion and final acceptance letters by the Clean Water Program will initiate stormwater mapping tasks (see section 2 on page 12). Receipt of the final acceptance letter by Operations will initiate maintenance and operations tasks (see section 3 on page 27).

Close Out

The project manager and construction manager will coordinate preparation of close out documents, including final expenditures. The project manager will provide a final report and a CD of the electronic project files to the Clean Water Program manager.

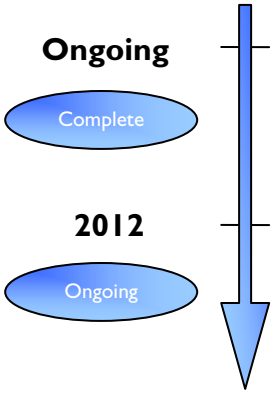
CWP engineers will update the *Capital Planning Database* with metrics from the final report.

Construction Management will oversee the production of record drawings, and Survey staff will notify the Clean Water Program of their location. The receipt of record drawings by Clean Water Program will initiate tasks to verify the stormwater infrastructure inventory.

Outputs

- Project plans, specifications, and estimates
- Completed stormwater capital projects
- As-built drawings (record drawings)
- Final expenditures and metrics for each project
- CD of electronic files to Clean Water Program
- Project final report

TIMELINE



- ✔ Implement structural stormwater controls program
- ✔ Stormwater capital planning
- ✔ Annual reporting on capital projects

- ❑ Continue structural stormwater controls program
- ❑ Continue capital planning
- ❑ Continue annual reporting on capital projects

FOR MORE INFORMATION ON PLANNING AND BUILDING COUNTY STORMWATER INFRASTRUCTURE

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RON.WIERENGA@CLARK.WA.GOV

Development and Redevelopment Flow Restoration Program

The Development and Redevelopment Flow Restoration Program ties into both county capital improvements described above and the regulatory program for development, redevelopment, and construction projects described below.

As allowed by the NPDES Phase I Municipal Stormwater Permit, Clark County elected to adopt an alternate and equally protective method of achieving the Permit's flow control requirements for development and redevelopment sites (referred to as development projects). Clark County developed an alternate approach to apply the NPDES Permit's flow control standard that utilizes both development regulations and a capital program to meet the requirement to control duration of erosive flows to historic rates. Ecology approved the program; however, the Washington State Pollution Control Hearings Board (PCHB), in a 2-1 ruling, revoked the program and remanded it to Ecology for modification. Clark County has appealed the ruling and continues to implement the program under the terms of the existing NPDES Permit, pending resolution through the appeals process.

Regulatory Requirements Summary

NPDES Permit S5.C.5 – Controlling Runoff from New Development, Redevelopment and Construction Sites

The NPDES Permit requires the county to have a program to prevent and control the impacts of runoff from new development, redevelopment, and construction activities. The program must apply to all development activity, including county projects such as roads and parks. The program must enforce development regulations that provide protection equivalent to the minimum requirements, thresholds, and definitions in Appendix 1 of the NPDES Phase I Municipal Stormwater permit and the design standards in the *Stormwater Management Manual for Western Washington*.

In 2009, Clark County adopted standards in Chapter 40.385 CCC that, in combination with actions under Department of Ecology Agreed Order No. 7273 (below), provide

equivalent protection under Washington Department of Ecology minimum requirement 7, Flow Control.

Agreed Order No. 7273

Clark County entered into Agreed Order No. 7273 with Ecology on January 6, 2010 to establish a program whereby the county's development regulations for flow control in combination with a capital program for restoring flow duration to historic conditions in areas of existing development would be equivalent to minimum requirement 7 of the NPDES Phase I Municipal Stormwater Permit.

The Development and Redevelopment Flow Restoration Program is described in Attachment A to the Agreed Order. It includes the purpose, procedures for tracking, description of allowable capital projects, project prioritization, calculations, geographic location and timing requirements, tracking, and reporting requirements.

County Policies, Rules and Regulations

Agreed Order Implementation

The *Agreed Order Implementation* policy outlines responsibilities for tracking obligations and credits, prioritizing flow restoration projects, and for reporting to achieve compliance with NPDES Permit S5.C.5 and Agreed Order 7273.

Flow Restoration Projects Tracking and Reporting

The county tracks obligations for flow restorations created by private development projects as well as credits for the county's flow restoration projects. In addition, the county annually reports obligations and credits to Ecology.

Purpose

The county must have an accounting system to track development and redevelopment projects that generate an obligation for the county to restore flow duration and county projects that earn credits for flow restoration in order to ensure that rates of stormwater runoff are restored to historic conditions on an equal number of acres as the obligation.

Responsibilities Matrix

Task	DES Director	DES CWP Program Manager	DES NPDES Permit Coordinator	DES CWP Engineer	PW Development Engineering Planning Tech	CD Building Safety
Tracks Projects Triggering SW Regulations	I	A	P	O	S	S
Identify Sites Creating Flow Restoration Obligations	O	A	P	O	S	S
Calculate Area Restored by County Projects	O	A	I	P	O	O
Annual Flow Restoration Program Summary	I	A	P	O	O	O
Calculate Annual Capital Expenditures	A	P	I	O	O	O
Calculate Capital Fund Balance	A	P	I	O	O	O
Financial Summary	I	A	P	O	O	O
Reporting to Ecology	I	A	P	O	O	O

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Identify Potential Flow Restoration Obligations

Public Works, Development Engineering and Community Development, Building Safety will report development and redevelopment projects that trigger stormwater requirements to the NPDES Permit coordinator. The coordinator will identify sites likely to create an obligation for the county to restore flow duration.

Identify Sites Creating Flow Restoration Obligations

When construction begins on a development site, the potential obligation becomes an actual obligation, accrued in the calendar year construction began. The Clean Water Program NPDES Permit coordinator or a designee will visit sites to verify construction began, and the project will be added to the *Capital Planning Database* to track the obligation.

Calculate Flow Restoration Obligation

The development project's design engineer will calculate the land cover for which an obligation is created and report it on the cover sheet of the final plans. The *Capital Planning Database* will be updated. For projects lacking a land cover estimate on the plan set cover, the NPDES permit coordinator will review the TIR and WWHM model results to determine the predevelopment land cover.

Calculate Area Restored to Historic Flows by County Projects

When Clark County completes a stormwater flow restoration project through its capital program (see County Stormwater Capital Improvements on page 62), a Clean Water Program engineer will calculate the area of land cover restored to historic flow conditions. The engineer will update the *Capital Planning Database* and prepare a project summary for the record.

Update Annual Program Summary

Early in each calendar year, the NPDES Permit coordinator will summarize pertinent obligation and credit information from the prior calendar year, including accrued and net obligation and area restored to historic flow conditions by county projects from information obtained from the *Capital Planning Database*.

The NPDES Permit coordinator will update the *Annual Program Summary* report to Ecology.

Update Financial Summary

The Clean Water Program manager will calculate capital program expenditures and remaining capital fund balance to complete a summary of annual expenses for the Development and Redevelopment Flow Restoration Program capital projects.

The permit coordinator will update the *Financial Summary* report to Ecology.

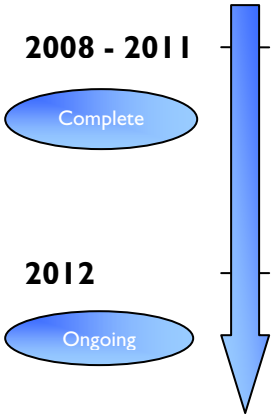
Report to Ecology

The NPDES Permit coordinator will attach reports tracking obligations, acres of land cover restored to historic flows by county projects, the *Annual Program Summary*, and the *Financial Summary* to the annual report submitted to Ecology by March 31st of each year.

Outputs

- Updates to the *Capital Planning Database*
- Reports on the Development and Redevelopment Flow Restoration Program to Ecology
- Certified engineering reports for flow restoration projects

TIMELINE



- ✔ Negotiate Agreed Order for compliance with Ecology
- ✔ Begin planning for implementation of the Development and Redevelopment Flow Restoration Program
- ✔ Report obligations and credits to Ecology

- ❑ Continue to report obligations and credits

FOR MORE INFORMATION ON DEVELOPMENT AND REDEVELOPMENT FLOW RESTORATION

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ROD.SWANSON@CLARK.WA.GOV

Regulatory Program for Development, Redevelopment, and Construction Projects

The county is the local land use regulator. As such, the NPDES Permit requires the county to regulate the discharge of runoff from new development, redevelopment, and construction activities in the county.

In 2009, the county updated its regulations in response to the 2007 NPDES Permit.

Regulatory Requirements Summary

NPDES Permit S5.C.5 – Controlling Runoff from New Development, Redevelopment and Construction Sites

The NPDES Permit requires the county to have a program to prevent and control the impacts of runoff from new development, redevelopment, and construction activities. The program must apply to all development activity, including private-sector development and county projects such as roads and parks. The program must enforce development regulations that provide protection equivalent to the minimum requirements, thresholds, and definitions in Appendix 1 of the NPDES Phase I stormwater permit and the design standards in the *Stormwater Management Manual for Western Washington*.

County Policies, Rules and Regulations

Clark County Code 40.385 – Stormwater and Erosion Control

Clark County regulates stormwater runoff and erosion control on development, redevelopment, and construction sites primarily in Chapter 40.385 Stormwater and Erosion Control. The purpose of the code is to safeguard public health, safety, and welfare by protecting the quality of surface and ground waters for drinking water supply, recreation, fishing and other beneficial uses through the application of best management practices (BMPs) for stormwater management and erosion control. It was adopted to minimize the degradation of receiving waters from impacts attributable to stormwater runoff, thereby not precluding the preservation of future restoration of beneficial uses.

The regulations generally apply to all development and construction projects, including county roads and parks that vested after April 13, 2009, whether or not they discharge to county storm sewers or to waters of the state. A notable exception is construction of buildings and impervious area for agricultural activity, which is only regulated under

the stormwater and erosion control code if projects discharge directly or indirectly to the county storm sewer system.

Clark County Code 40.380 – Stormwater and Erosion Control

For development, redevelopment, and construction sites that vested prior to April 13, 2009, Clark County regulates stormwater runoff and erosion control under Chapter 40.380 Stormwater and Erosion Control (Clark County Code). Although this code has been superseded by Chapter 40.385, it remains in effect for those projects that vested under it.

Clark County Code 13.26A – Water Quality

Clark County regulates the discharge of contaminants to surface water, stormwater, and groundwater to protect the county's surface and groundwater quality by providing minimum requirements for reducing and controlling the discharge of contaminants and stormwater flows. It requires certain sites and activities to utilize best management practices to control release of contaminants.

For purposes of regulating development activities, the Chapter applies to those limited projects that only trigger minimum requirement 3 per the *Clark County Stormwater Manual*.

Clark County Code 40.430 – Geologic Hazard Areas

Identifies sites where geologic concerns such as erosion and steep slopes are coincident in preparation of erosion control and stormwater site plans.

Clark County Stormwater Manual

The *Clark County Stormwater Manual* is the technical guide that project proponents follow to identify stormwater management requirements for development and construction projects in the county. The manual contains county requirements and procedures specific to Clark County that differ from the *SMMWW*; for the most part, the county manual references the *SMMWW* to meet the minimum requirements.

Stormwater Facility Maintenance Manual

Chapter 40.385 CCC requires that all new stormwater treatment and flow control facilities be maintained according to the standards in Clark County's *Stormwater Facility Maintenance Manual*. The manual is also applied to all existing facilities under Chapter 13.26A.

Stormwater Pollution Control Manual

The *Clark County Stormwater Pollution Control Manual: Best Management Practices for Businesses and Government Agencies* is the BMP manual for meeting minimum requirement #3 from the *SMMWW*.

Clark County Code 40.450 and 40.440

Chapters 40.450 Wetland Protection and 40.440 Habitat Conservation regulate some stormwater discharges and the placement of treatment and control facilities in habitat and wetland buffers.

Clark County Code 40.510

Applications for development, redevelopment, and construction require different levels of review depending on their impacts to the community, which are defined in Chapter 40.510 CCC. The levels of review are ministerial decisions (Type I), administrative decisions (Type II), and quasi-judicial decisions (Type III).

Management Practice: Review and Approval for Non-Manual Stormwater Treatment BMPs

The Environmental Services Department follows a management practice for determining acceptability of stormwater treatment BMPs that are not in the *SMMWW*. This practice conforms to guidance in the *SMMWW*.

Stormwater Review and Enforcement of Development and Construction Applications

Purpose

Clark County has a system of ordinances, technical manuals, plan review, inspection and enforcement to apply the NPDES Permit minimum requirements to development, redevelopment, and construction projects.

For stormwater, the purpose of the review is to determine:

- Applicability of the stormwater and erosion control minimum requirements.
- Compliance with applicable minimum requirements.
- Compliance with other county-specific stormwater requirements listed in chapters eight through 11 of the Clark County Stormwater Manual.

Inspection and enforcement strives to ensure that construction sites correctly and consistently use erosion control BMPs to prevent sediment-laden runoff from leaving

the sites, and that permanent stormwater BMPs for conveyance, treatment, and flow control are properly installed, constructed, and transferred in good condition to the ultimate owners/operators.

Interdepartmental Responsibilities Summary

Responsibility for implementing the stormwater code is shared by several departments and is guided in several cases by interdepartmental MOUs. Environmental Services will update and maintain these agreements.

Community Development Department – Permit Services

Permit Services will accept most types of development and construction applications and determine if applications include the required submittals. Permit Services staff will review residential building permit applications for stormwater compliance.

Community Development Department – Building Safety

Building Safety will inspect building construction sites for compliance with erosion control, source control, preservation of natural drainage, and onsite stormwater management.

Public Works Department – Development Engineering

Development Engineering staff will provide engineering review of stormwater and erosion control plans on development sites, including residential and non-residential development sites, as well as Public Works projects. Development Engineering staff will oversee the issuance of the plat, the final engineering as-built documents (record drawings), and the maintenance warranty, if applicable.

Public Works Department – Construction Management

Construction Management staff will inspect development sites, including county projects, for compliance with stormwater engineering plans and erosion control plans. Inspections for private development sites will be done for Development Engineering.

Environmental Services Department – Clean Water Program

Clean Water Program staff will support decision-making regarding interpretation of the code and manuals, providing documentation of their findings.

Environmental Services Department – Code Enforcement

Code Enforcement will enforce erosion control violations on development and building construction sites as needed.

Responsibilities Matrices

The review and enforcement process varies depending on complexity and scope of the

project. For stormwater review purposes, projects generally can be divided into residential development projects (subdivisions), non-residential development projects, residential construction projects (individual home construction), and Public Works projects.

The first matrix below describes responsibilities at the department and division level, and then four separate matrices describe responsibilities and accountability at the staff level for each type of review.

Overview of Regulatory Review and Enforcement Responsibilities

Task	CD Permit Services	CD Building Safety	DES Code Enforce-ment	PW Development Engineering	PW Construction Management	DES Clean Water Program
Plan Review - residential construction	P	S	O	O	O	S
Inspect building construction sites	I	P	O	O	O	I
Engineering review - development	S	O	O	P	C	I
Accept "non-manual" treatment BMPs	O	O	O	P	O	C
Inspect development sites	O	O	O	S	P	I
Inspect Public Works sites	O	O	O	S	P	I
Enforce erosion control	I	S	P	O	P	I
Maintenance warranty inspection	O	O	O	S	P	I
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted						

Residential Development (Subdivision, Short Plat)

Task	CD Building Official	CD Permit Tech	CD Dev. Services Mgr.	CD Planner	PW Dev. Engineering Manager	PW Review Engineer	PW Eng. Team Lead	PW Planning Technician	PW Office Assistant	PW Const. Manager	PW Inspector	DES CWP Engineering Tech
Accept applications and plans	A	P	O	S	C	O	S	S	S	O	O	O
Pre-application conference	O	S	A	S	C	P	S	I	I	O	O	O
Preliminary engineering review	O	S	I	I	A	P	C	S	S	O	O	O
Final engineering review	O	S	O	O	A	P	C	S	S	O	C	O
Construction approval	O	O	O	O	A	P	C	S	S	O	C	O
Pre-construction conference	O	O	O	O	I	C	C	S	S	A	P	O
Development inspection	O	O	O	O	I	C	C	S	S	A	P	O
Approve record drawings	O	O	O	O	A	P	C	S	S	S	S	O
Accept maintenance bond	O	O	O	O	A	S	O	P	S	S	I	O
Issue completion of construction notice	O	O	O	O	A	I	O	P	S	S	I	I
Record final plat	O	O	O	O	A	O	C	P	S	S	O	I
Distribute as-built to DES	O	O	O	O	A	O	O	S	P	S	O	I
22-month off-warranty inspection	O	O	O	O	A	O	O	S	S	S	P	O
Release warranty bond	O	O	O	O	A	O	O	P	S	S	I	I

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Non-Residential Development

Task	CD Building Official	CD Permit Tech	CD Dev. Svcs. Mgr.	CD Planner	PW Dev. Eng. Mgr.	PW Review Engineer	PW Eng. Team Lead	PW Planning Tech	PW Office Assistant	PW Inspector	DES CWP Eng. Tech
Accept applications and plans	A	P	I	S	O	S	O	S	S	S	O
Pre-application conference	O	S	A	P	O	S	O	O	O	O	O
Preliminary engineering review	O	S	I	I	A	P	C	S	I	O	O
Final engineering review	O	S	O	O	A	P	A	S	I	C	O
Construction approval	O	O	O	O	A	S	A	S	I	C	O
Pre-construction conference	O	O	O	O	A	C	O	O	O	P	O
Development inspection	O	O	O	O	A	C	O	O	S	P	O
Approve as-builts	O	O	O	O	A	P	O	I	S	S	O
Issue completion of construction notice	O	O	O	O	A	I	O	P	S	I	I
Distribute as-built to DES	O	O	O	O	A	O	O	O	P	O	I
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted											

Residential Construction (Individual Lots)

Task	CD Permit Technician	CD Building Safety Inspector	CD Building Official
Accept applications and plans	P	O	A
Initial drainage inspection	S	P	A
Stormwater review	P	O	A
Issue Building Permit	P	O	A
Construction inspection	I	P	A
Issue Occupancy Permit	S	P	A
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted			

Public Works Projects

Task	DES CWP Eng. Tech	PW Dev. Eng. Manager	PW Dev. Eng. Team Lead	PW Dev. Eng. Engineer	PW Dev. Eng. Planning Tech	PW Eng. Program Design Manager	PW Eng. Program Design Engineer	PW Eng. Program Construction Section Manager	PW Eng. Program Construction Engineer	PW Eng. Program Construction Inspector	PW Eng. Program Survey	PW Operations and Maintenance
Design	O	O	C	C	O	A	P	I	I	I	S	O
Pre-application conference	O	C	S	P	S	O	O	A	P	S	O	O
Preliminary engineering review	O	C	S	P	S	I	C	I	O	O	O	O
Final engineering review	O	A	S	P	S	I	C	I	O	O	O	O
Construction approval	O	O	O	O	O	O	O	A	P	S	O	O
Construction inspection	O	O	O	O	O	O	C	A	S	P	O	O
Final walk-through	O	O	O	O	O	O	S	A	S	P	O	S
Issue substantial completion	I	O	O	O	O	O	O	A	P	S	O	I
Issue physical completion	I	O	O	O	O	O	O	A	P	S	O	I
Issue final acceptance	I	O	O	O	O	O	O	A	P	S	O	I
Produce and distribute record drawings	I	O	O	O	O	O	S	A	P	S	S	I

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Residential Development Project Review

Residential development projects are divisions of land to create individual lots and construction of infrastructure such as roads and storm sewer. Many aspects of residential development project review will not concern stormwater; only aspects concerning stormwater are covered in this plan.

Pre-Application Phase

Applicants typically are required to submit initial information and meet with a planner, engineer, and other pertinent staff in a Pre-application Conference (PAC) before an applicant submits a completed development application. The PAC will help determine options and likely requirements for stormwater control, among many other regulations and requirements.

Preliminary Land Division and Preliminary Engineering Review Phase

The applicant will submit an application for residential land division (subdivision or short plat) to the Permit Center along with a preliminary stormwater plan in accordance with section 3.2 of the *Clark County Stormwater Manual*.

Development Engineering staff will review the preliminary stormwater plan to evaluate whether the proposal for stormwater controls is feasible given existing site conditions and constraints. The engineer's Findings and Conditions of Approval will appear in the Staff Report and Decision (or the Land Use Hearing Examiner Decision), which will be forwarded to the applicant. This decision sets the project's vesting date for applicable county regulations. The applicant will have five years from vesting to obtain a fully complete determination on the final land division (plat) application.

Findings describe the engineer's determination of whether or not each aspect of the stormwater proposal meets county code. Conditions of Approval list the engineer's requirements for how to meet code, in cases where the proposal does not meet it, and they must be met in the final engineering plan.

Final Engineering Review Phase

The applicant will submit final plans for the residential development, including a final stormwater plan in accordance with section 3.3 of the *Clark County Stormwater Manual*. The final stormwater plan will provide final engineering design (Technical Information Report) and construction drawings for the stormwater aspects of the proposed project and a construction Stormwater Pollution Prevention Plan (SWPPP).

Development Review engineers will:

- Ensure that the Conditions of Approval from the preliminary land division have been met.

- Verify that applicable minimum requirements have been met.
- Review engineering calculations of stormwater flows, sizing of flow control facilities, and sizing of conveyances.
- Verify adequacy of erosion control BMPs.
- Perform any other engineering review required for stormwater.

Responsible officials from Public Works, Community Development, Environmental Services, and Public Health will sign the final plans. The Development Engineering manager will make the final approval. Then the planning technician will return the approved plans to the applicant.

The Development Engineering office assistant will open a development inspection case in *Tidemark* in preparation for the next phase of the process.

Development Inspection Phase

During development inspection, the applicant will construct the development's infrastructure, including grading, roads, and stormwater controls, according to the approved final plans. Public Works development inspectors will inspect the site for conformity with the plans.

The process begins when the applicant submits the final construction plan and application for development inspection.

The assigned development inspector will hold a Preconstruction Conference with the applicant. The inspector will review erosion control requirements with the applicant and will receive the name of the Certified Erosion Control and Sediment Lead (CECSL) for the site. The inspector will reiterate storm system requirements and additional inspection-related policies for storm system installation. After the conference, the development inspector will give approval to begin constructing the project.

During construction of the development, the development inspector will inspect the site to ensure that erosion control measures are operational and effective. The inspector will work with the developer to achieve compliance, using correction notices and stop work orders if necessary. If there is evidence of continued neglect, the inspector will call a code enforcement officer to enforce erosion control measures.

The development inspector also will verify that stormwater facilities are constructed as designed.

At the end of construction, the applicant will submit record drawings and a maintenance bond, if applicable, for any public improvements. (Public improvements are roads and stormwater conveyance and facilities that will fall into public ownership upon acceptance of the development.) A Development Engineering engineer will approve the

record drawing and then a Development Engineering planning technician will accept the maintenance bond, if applicable.

Development Engineering staff will provide an electronic record drawing file to Environmental Services, then send the Mylar plan to the state archives.

After these steps are complete, the planning technician will issue a notice of completion of construction to the applicant and copy it to several departments, including the Clean Water Program and Public Works Maintenance and Operations. The notice signals the start of the maintenance warranty period, if applicable (see below).

The notice of completion of construction constitutes provisional county acceptance of the public infrastructure, including public stormwater facilities. In the case of private facilities, completion of construction is the end of county involvement in construction and the regulated facility maintenance inspection process will begin.

Receipt of the notice of completion of construction will initiate some stormwater mapping tasks (see Mapping the Storm Sewer Infrastructure on page 12) and some maintenance inspection tasks (see Operating and Maintaining the Storm Sewer System, County Property and Roadways on page 27).

Final Land Division Phase

The final land division will begin after the development inspection phase begins but before it ends.

The applicant will submit the final land division application and the draft plat. The plat will contain required information describing facility ownership and maintenance responsibility, stormwater tracts, and drainage easements. The plat will be routed to several departments for review and approval.

After approval of the draft plat, the applicant will submit a Mylar version that will be signed by the Planning Director, the County Engineer, and the Board of Clark County Commissioners. Development Engineering staff then will record the final plat with the Auditor and issue a plat notification to the developer, copied to several departments, including the Clean Water Program.

Receipt of the plat notification by Clean Water program may initiate some stormwater mapping tasks, (see Mapping the Storm Sewer Infrastructure on page 12).

The final plat must be recorded before building permits for home construction will be issued for lots in the development (see Residential Construction Project Review on page 92).

Maintenance Warranty Period

Most, but not all, residential developments will have public improvements, including public stormwater infrastructure.

For residential developments with public improvements, a two-year maintenance warranty period will begin at completion of construction. During the maintenance warranty period, the developer will be responsible for continued maintenance of the stormwater facilities.

During the 22nd month of the maintenance warranty, a development inspector will inspect the public stormwater facilities for compliance with maintenance standards.

If the stormwater facilities are found to be in good condition and properly maintained, the development inspector will recommend release of the maintenance bond. The Development Engineering planning technician will release the bond and notify the Clean Water Program and Public Works Maintenance and Operations.

If the facility has components that fail the maintenance inspection, the planning technician and development inspector will work with the developer to obtain needed repairs. If the developer fails to make repairs, the planning technician will demand the bond from the surety company.

After repairs are made, the Clean Water Program will initiate stormwater mapping tasks, if necessary, (see Mapping the Storm Sewer Infrastructure on page 12), and Public Works Maintenance and Operations will initiate maintenance and operations tasks (see Operating and Maintaining the Storm Sewer System, County Property and Roadways on page 27).

Non-Residential Development Project Review

Non-residential developments include commercial and industrial projects as well as schools, churches, and other non-residential land uses. These projects construct infrastructure such as roads and stormwater along with the buildings. Multifamily housing projects also are reviewed using this process. Occasionally, commercial projects may also go through a land division. Many aspects of non-residential development project review will not concern stormwater and are not covered in this plan.

Pre-Application Phase

Applicants are typically required to submit initial information and meet with a planner, engineer, and other pertinent staff in a Pre-application Conference (PAC) before submitting a completed development application. The PAC will help determine options and tentative requirements for stormwater control, among many other regulations and requirements.

Preliminary Site Plan and Preliminary Engineering Phase

To begin the process, the applicant submits an application for preliminary site review to the Permit Center along with a preliminary stormwater plan in accordance with chapter 3.2 of the *Clark County Stormwater Manual*.

The assigned Development Engineering engineer will review the preliminary stormwater plan to evaluate whether the proposal for stormwater controls is feasible given the available information on existing site conditions and constraints. The engineer's Findings and Conditions of Approval will appear in the Staff Report and Decision (or Land Use Hearing Examiner Decision), which will be forwarded to the applicant.

Findings describe the engineer's determination of whether or not each aspect of the stormwater proposal meets county code. Conditions of Approval list the engineer's requirements for how to meet code, in cases where the proposal does not meet it, and they must be met in the final engineering plan.

The applicant will have several years to begin the construction process, depending on circumstances.

Final Site Plan and Final Engineering Review Phase

The applicant will submit final plans for the development, including a final stormwater plan in accordance with section 3.3 of the *Clark County Stormwater Manual*. The final stormwater plan will provide final engineering design and construction drawings for the stormwater aspects of the proposed project and a construction Stormwater Pollution Prevention Plan (SWPPP).

The assigned Development Review engineer will:

- Ensure that the Conditions of Approval from the Final Decision have been met.
- Verify that applicable minimum requirements have been met.
- Review engineering calculations of stormwater flows, sizing of flow control facilities, and sizing of conveyances.
- Verify adequacy of erosion control BMPs.
- Perform any other engineering review required for stormwater.

Responsible officials from Public Works, Community Development, and Public Health will sign the final plans. The Development Engineering manager will make the final approval. The approved plans are returned to the applicant.

Development Engineering will open a development inspection case in *Tidemark* in preparation for the next phase of the process.

Building Permit Review

The applicant will submit building permit applications to Permit Services. Construction of structures will be concurrent with construction of the development; therefore, most stormwater review will have already occurred.

The building permit must be issued before construction of structures may begin.

Development Inspection Phase

During development inspection, the applicant will construct the development's infrastructure, including grading, roads, and stormwater controls. The project's buildings are also erected during this phase.

The process begins when the applicant submits the final construction plans and application for development inspection.

The assigned Public Works development inspector will hold a Preconstruction Conference with the applicant. The inspector will review erosion control requirements with the applicant and will receive the name of the Certified Erosion Control and Sediment Lead worker (CECSL) for the site. The inspector will reiterate storm system requirements and additional inspection-related policies for storm system installation. After the conference, the development inspector will give approval to begin constructing the project.

During construction, the development inspector will inspect the site as needed to ensure that erosion control measures are operational and protective. If necessary, a code enforcement officer will be called to enforce erosion control measures. If the project has a state-issued NPDES construction permit, then violations may be referred to Ecology.

The inspector also will ensure that stormwater facilities are constructed as designed.

At the end of construction, the inspector will verify that the facility was built as shown on approved design plans. The applicant will submit record drawings and, if applicable, a maintenance bond for any public improvements in the right-of-way. A Public Works engineer will review the record drawings for accuracy before approving it. After

approval of the completed facilities and record drawings, a Development Engineering planning technician will accept the maintenance bond.

When a record drawing is received, Development Engineering staff will give an electronic file to Environmental Services and send the Mylar plan to the state archives.

The planning technician will issue the notice of completion of construction to the applicant and copy it to several county agencies, including the Clean Water Program. The notice signals the start of the maintenance warranty period, if applicable.

Receipt of the completion of construction by the Clean Water Program will initiate some stormwater mapping tasks for projects with either public or private stormwater facilities (see Mapping the Storm Sewer Infrastructure on page 12).

Maintenance Warranty Period

The maintenance warranty period is relevant for those non-residential developments that have public stormwater infrastructure, however, many of these will only include privately-owned facilities.

A two-year maintenance warranty period will begin at completion of construction. During the period, the developer will be responsible for continued maintenance of the stormwater facilities.

During the 22nd month of the warranty, a development inspector will inspect the public stormwater facilities for compliance with maintenance standards.

If the stormwater facilities are found to be in good condition and properly maintained, the development inspector will authorize release of the maintenance bond and will notify the Clean Water Program and Public Works Maintenance and Operations that the bond has been released.

Receipt of the bond release notification will initiate maintenance and operations tasks, (see Operating and Maintaining the Storm Sewer System, County Property and Roadways on page 27).

If the facility has components that fail the maintenance inspection, the planning technician and development inspector will require the developer to obtain needed maintenance and repairs. If the developer fails to make repairs, the planning technician will demand the bond from the surety company.

After repairs are made, the Clean Water Program will initiate stormwater mapping tasks, if necessary, (see Mapping the Storm Sewer Infrastructure on page 12), and Public Works Maintenance and Operations will initiate maintenance and operations tasks (see Operating and Maintaining the Storm Sewer System, County Property and Roadways on page 27).

Residential Construction Project Review

Residential construction projects include construction or expansion of single-family and duplex homes and their appurtenances, such as decks, garages, and driveways, and outbuildings. Many aspects of residential construction project review will not concern stormwater and are not addressed here.

Building Permit Application Review – Stormwater

The applicant will submit a residential building permit application including a plot plan showing proposed building footprint(s), erosion control measures, and stormwater control BMPs, including dispersion, to the Permit Center.

The assigned Permit Center permit technician will call for an initial drainage inspection by the Building Safety Division to verify presence of steep slopes or geohazard areas. If they exist on site, then the applicant will be required to consult a licensed geotechnical engineer to design stormwater controls before proceeding.

The permit technician will review the residential building permit application to verify applicability of the minimum requirements and selection and use of allowed stormwater BMPs and erosion control BMPs.

The building plans will include standard details for applicable stormwater BMPs and erosion control BMPs.

If the residential construction site is within an existing subdivision with an approved stormwater plan that provides flow control and treatment, then the permit technician will recommend that the applicant consult the development project's engineering plans to determine stormwater requirements, such as roof drain infiltration and amended soils, for the lot. In those cases, the permit technicians also will include requirements from the recorded plat and engineering drawings as conditions on the building permit.

If the residential construction site is not part of an existing subdivision with an approved stormwater plan, then applicants will follow minimum requirements applicable to their projects. Generally, if minimum requirements 1- 5 apply, the applicant can complete the stormwater plan on his or her own. If minimum requirements 1-10 apply, the applicant likely will need to consult an engineer complete the stormwater plan.

The Permit Center will issue the building permit before construction may begin.

Construction Inspection

During erection of the structure, Building Safety Division inspectors will inspect the site for conformance to the stormwater plan in the building permit and to ensure that erosion control BMPs are properly installed, as well as for source control, preservation of natural drainage, and onsite stormwater management.

At the end of construction, an inspector will retrieve the erosion control log and include it in the project file.

Public Works Project Review

Projects built by the Public Works department, including roads, parks, and stormwater facilities will be reviewed under the same procedures as privately-developed non-residential projects with a few key differences.

Many Public Works projects will not require land use review, including roadways through existing right-of-way; therefore, the process will frequently begin at the final engineering review phase. Those that require land use review will begin at the preliminary site plan and preliminary engineering phase (above).

Additionally, the development inspection phase is replaced by a construction management phase. Public Works will use its own construction inspectors to oversee the construction of the project to ensure that it is built as designed and bid. Enforcement of erosion control and other measures is through contract management.

Before completion of a project, the construction engineer will invite stakeholders, including the Public Works Maintenance and Operations water quality crew chief, to a walk-through of the new roadways and/or facilities. The construction manager also will copy the Clean Water Program and the Public Works Operations and Maintenance program on the letters of physical completion and final acceptance of the project.

At the final acceptance, Public Works will develop a record drawing according to its *As-Built Plan Preparation Policy*, dated May 7, 2009.

Outputs

General outputs:

- Stormwater site plans that meet county standards
- Construction site management that controls excessive runoff and sediment
- Completed projects include stormwater facilities meeting county standards
- Assigned ownership and maintenance responsibility for stormwater control facilities
- Record drawings are completed
- Completed project notifications to programs

Residential Development Project Review Outputs

- Final Decision denying, approving, or approving with conditions the proposed development project
- Technical Information Report
- Approved final construction plan

- SWPPP
- Record drawings
- Approved final plat
- Notice of completion of construction
- Maintenance bond release letter, if applicable

Non-Residential Development Project Review Outputs

- Final Decision denying, approving, or approving with conditions the proposed development project
- Technical Information Report
- Approved Final Site Plan
- Approved final construction plan
- SWPPP
- Record drawings
- Erosion control log
- Building plan
- Notice of completion of construction
- Maintenance bond release letter, if applicable

Residential Construction Project Review Outputs

- Building Permit including plot plan with stormwater requirements
- Erosion control plan
- Erosion control log
- Building Plans

Public Works Project Review Outputs

- Technical Information Report
- Approved final construction plan
- Record drawings
- Completion of Construction notice
- Physical Completion letter
- Final Acceptance letter

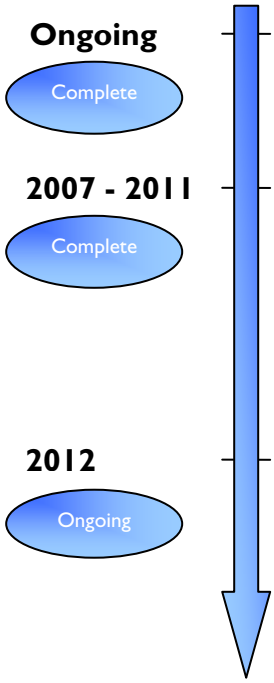
BASIN PLANNING

The county's NPDES Permit allows certain requirements for controlling runoff on development sites to be tailored to local circumstances through the use of basin plans or other similar water quality and quantity plans. The alternate requirements must provide equal or similar protection of receiving waters and equal or similar levels of pollutant control as compared to Appendix 1 of the permit, which defines minimum requirements.

Basin planning often is a process to study watershed-scale hydrology through modeling and field observations in order to tailor flow control requirements for new development to local stream conditions. It can also include water quality issues and capital planning.

The technical analysis process is discussed in more detail in Chapter 3.

TIMELINE



- ✔ Legal authority to require maintenance of facilities
- ✔ NOI forms available

- ✔ Allow LID tools
- ✔ Adopt stormwater regulations equivalent to SMMWW
- ✔ Legal authority to require maintenance of facilities
- ✔ Procedures to implement the *SMMWW*
- ✔ NOI forms available
- ✔ Staff training on *SMMWW*

- ❑ Tailor Minimum Requirements to local circumstances through basin planning
- ❑ Continue to enforce stormwater regulations
- ❑ Continue to implement the *SMMWW*
- ❑ Continue staff education

FOR MORE INFORMATION ON HOW DEVELOPMENT, REDEVELOPMENT, AND CONSTRUCTION SITES ARE REGULATED FOR STORMWATER AND EROSION CONTROL

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Section 6
Public Involvement, Education and Outreach about Stormwater and the Stormwater Management Program

Clark County provides ongoing opportunities for the public to review and comment on the stormwater management program through various mechanisms. Public input is one way to tailor policy within the guidelines of the NPDES Permit. The county also offers numerous stormwater education opportunities for the public. The education program is aimed at various audiences and is designed to help reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts.

Public Information, Involvement and Participation

Regulatory Requirements Summary

NPDES Permit S5.C.4 - Public Involvement and Participation

The NPDES Permit requires the county to provide ongoing opportunities for public involvement in the stormwater management program development and implementation. The public must have opportunities to participate in the development, implementation and update of the SWMP and the county must consider public comments on it. The Stormwater Management Program Plan, annual report and other submittals required by the permit must be posted on the Web.

County Policies, Rules and Regulations

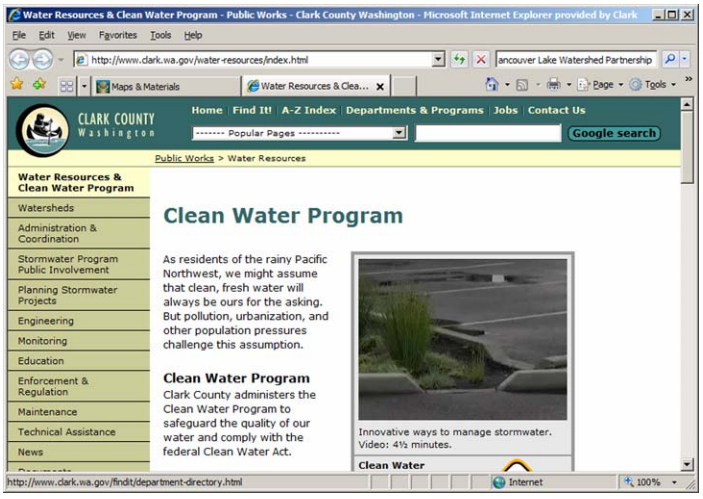
Clark County Code Chapter 13.30A

County Code Section 13.30A.040 defines the role of the Clark County Clean Water Commission (CWC), a citizen commission formed to advise the Board of Clark County Commissioners (BOCC). The CWC will advise the BOCC on the focus of the SWMP, the effectiveness of the SWMP, program service levels, financing, and policies on surface and stormwater issues.

Public Information

Purpose

The Clean Water Program provides information to the public about the stormwater management program to publicize the program's services to rate payers and keep the community abreast of current stormwater management issues.



Responsibilities Matrix

Task	DES CWP Manager	DES Sustainability & Outreach Manager	DES Sustainability Specialist	PW Public Information Officer	DES CWP Professional Staff
Provide content	A	I	I	S	P
Write / design eNewsletter	S	A	P	S	S
Schedule eNewsletter	S	A	P	S	O
Manage opt-in mailing list	O	A	P	O	O
Web updates	I	A	P	O	S
Write media releases	S	A	P	S	S

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

eNewsletter

Clark County Environmental Services publishes an eNewsletter to distribute information about local environmental events and activities in the community, including clean water-related issues.

The eNewsletter is distributed monthly to a broad cross-section of the community, including individuals and organizations with an interest or a responsibility for managing stormwater.

An Environmental Services sustainability specialist writes and designs the newsletter, sets deadlines, and manages the mailing list.

Clean Water Program Web Site

The Clean Water Program Web site offers an opportunity for the public to review many program activities and documents, as well as receive educational messages about stormwater.

The Web site will be updated as prompted by creation of new products and changes in program activities. Updates will be made by the education and outreach coordinator with input on content from the program's professional and technical staff.

Media Releases

The Clean Water Program releases information on various topics to the media to publicize noteworthy events. The Environmental Services director or Clean Water Program manager will call for a media release. The education and outreach coordinator will write the release with the support of the Public Works department public information officer and the Clark County Public Information Office. Releases will be distributed to the media by the Clark County Public Information Office.

Outputs

- eNewsletter
- Content on CWP Web site
- Media releases

PUBLIC INVOLVEMENT AND PARTICIPATION

Purpose

The purpose of involving the public in the SWMP is to make an effort to tailor the program, while considering the prescriptive nature of the permit, to the local community's priorities. Public feedback about program effectiveness and the public's needs also helps the Board of Clark County Commissioners set policies for stormwater management.

Responsibilities Matrix

Task	BOCC	DES CWP Manager	DES CWP Program Coord.	DES CWP NPDES Permit Coordinator	DES CWP Office Assistant	DES CWP Staff	DES Enhancement & Permitting Manager	DES Enviro. Permitting Coord.
Appoint Clean Water Commission	A / P	I	I	I	I	I	O	O
CWC liaison	C	A	P	S	S	S	O	O
CWC secretary	O	A	S	O	P	O	O	O
Respond to SWMP public comments	I	A	S	P	I	I	O	O
Respond to SEPA comments for stormwater capital projects	I	I	O	O	O	S	A	P
Community presentations	I	A	P	S	S	S	O	O
Other code update coordination	I	A	responsibilities assigned as needed				O	O
Customer service adaptive management	I	A	any CWP staff may be primary in his/her area				O	O

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Clean Water Commission

The Clean Water Commission (CWC) is a nine-member advisory panel appointed by the Board of Clark County Commissioners. It provides a forum for public participation in the stormwater management program and also informs the BOCC about stormwater topics and policy.

Staff Support

Environmental Services Clean Water Program staff will support the CWC in a variety of ways.

A program coordinator will be the primary staff liaison to the CWC. The liaison will attend most meetings and provide minimal facilitation when required, respond to requests for information from CWC members, and update the Commission's calendar of events.

The Clean Water Program office assistant will attend each meeting to take notes and distribute meeting materials. An office assistant will update the Clean Water Commission Web pages with current information and documents.

Other staff members will attend meetings as required to present updates on program activities.

Member Appointments

Openings on the CWC will be listed in local newspapers by the BOCC. Interested applicants, including incumbents seeking another term, must submit a letter of interest and a resume to the BOCC, which will conduct interviews and select a candidate to fill the position.

Monthly Public Meeting

The Clean Water Commission will hold a public meeting on the first Wednesday of each month at 6:30 p.m.

Discussion topics will include updates from staff on the stormwater management program and updates from staff on other Clean Water Program functions, such as surface water / stormwater monitoring, capital project planning, and regulatory changes (such as progress of the LID Working Groups).

At meetings, the CWC will review and discuss major stormwater policy changes.

The Commission will hear public comment both prior to and following the discussion.

Communications with the Board of Clark County Commissioners

Annual Meeting

Annually, the Clean Water Commission will meet with the Board of County Commissioners in a public meeting to present a review of the effectiveness of the Clean Water Program and to discuss other stormwater topics or concerns.

The CWC will present an annual report at this meeting.

Other Communications

The Clean Water Commission may elect to communicate with the BOCC at any time via letter, memorandum, or during scheduled public comment periods at Work Sessions and Hearings.

Stormwater Management Program Review and Input

Clark County will offer its Stormwater Management Program Plan each year on the Clean Water Program Web site for review and comment by the public at http://www.clark.wa.gov/water-resources/SWMP/stormwater_plan.html.

The Clean Water Program manager or a designee will respond to comments.

Stormwater Capital Projects SEPA

As the Clean Water Program builds stormwater capital projects (see County Stormwater Capital Projects on page 62), each project will be subject to public review and comment under the Washington State Environmental Policy Act (SEPA).

The Environmental Services Environmental Permitting coordinator assigned to the project will write and distribute to stakeholders a Determination of Significance or a Determination of Non-Significance. The required public comment period will be held. The coordinator will respond to any comments received, and, if warranted, require changes to the project's design.

Community Presentations

As requested, Clean Water Program staff will provide information on the program's activities to community and civic groups, at times in concert with the Clean Water Commission, to distribute information about the stormwater management program and get feedback on community priorities.

Code Updates

Code revisions for water quality, stormwater and erosion control, and the Clean Water Fee regulations require extensive public outreach, review and comment, which will be coordinated by the Clean Water Program. The code update process may include significant public involvement in the form of a Stakeholder Advisory Committee (SAC) and a Technical Advisory Committee (TAC), as well as numerous presentations and meetings with community and stakeholder groups. Public feedback will be incorporated throughout the process.

Customer Service / Adaptive Management

The Clean Water Program and its designees maintain regular contact with the public through daily programmatic activities such as customer service for the Clean Water Fee, source control

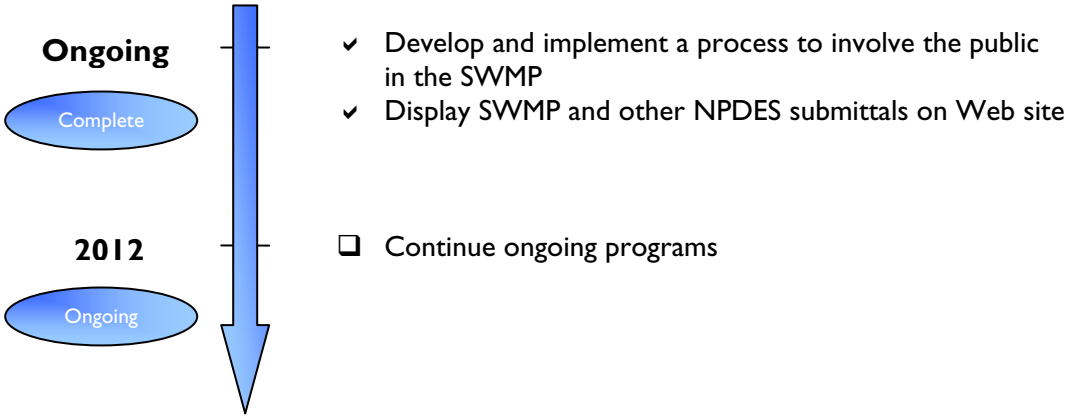
inspections (section 4), inspections of regulated stormwater control facilities at businesses and subdivisions (section 3), SNAP assessments (chapter 3), response to information requests, and complaint response. Staff routinely receives feedback during these contacts and frequently incorporates suggestions into their daily procedures and processes.

For example, as a result of public feedback, the Clean Water Program initiated a program to educate residential subdivision Homeowners' Associations about proper maintenance of their stormwater facilities.

Outputs

- Monthly Clean Water Commission notes including public comments
- Clean Water Commission Annual Report to the Board of Clark County Commissioners
- Log of public comments on the Stormwater Management Program
- Log of public comments from community presentations
- SEPA file for each stormwater capital project
- Public testimony transcripts from code update Hearings
- Record of public input for significant code updates
- Media releases
- eNewsletters
- Web content

TIMELINE



For more information on the county's efforts to inform and involve the public in the stormwater management program

Earl Rowell, Clean Water Program, Program Coordinator, 397-2121, x 4580
Earl.Rowell@clark.wa.gov

Education and Outreach Program

Regulatory Requirements Summary

NPDES Permit S5.C.10 - Education and Outreach Program

The NPDES Permit requires the county to have an educational program aimed at various audiences to help reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts.

County Policies, Rules and Regulations

Clark County Code Chapter 13.26A

County Code Section 13.26A.005 sets out an intent to use education and technical assistance to business owners and the general public as a primary means of implementing a successful pollution source control and prevention program.

Clark County Code Chapter 13.30A

Section 13.30A.050(D) states that "many of the difficulties in managing of surface and stormwater problems result in part from the general lack of public knowledge about the relationship between human actions and surface and stormwater management. In order to achieve a comprehensive approach to surface and stormwater management, the county should provide general information to the public about land use and human activities that affect surface and stormwater management."

Education for the General Public

Purpose

The goal of the stormwater education and outreach program is to reduce or eliminate behaviors and practices that adversely impact stormwater runoff. The support and awareness of the general public is crucial to achieving this goal. Education for the general public will focus on the following topics:

- Importance of clean water.
- General impacts of stormwater flows into surface waters.
- Impacts from impervious surfaces.
- Contributions we each make to the problem.
- Each person's ability to help protect and improve the quality of Clark County's water resources through source control BMPs and environmental stewardship.

Responsibilities Matrix

Task	DES Sustainability & Outreach Manager	DES Outreach Supervisor and Sustainability Specialist	DES AmeriCorps Volunteer	Partner Agencies / Contractors
Coordinate education programs	A	P	S	C
Track and measure deliverables	A	P	S	S
Create messages, programs and collateral	A	P	P	P
Distribute messages and collateral	A	P	P	P
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted				

Regional Advertising Campaign

The Regional Coalition for Clean Rivers and Streams is a group of Portland/Vancouver metropolitan-area cities, counties, and stormwater utilities. The focus of the group is to coordinate, develop and implement a regional public awareness media campaign promoting nonpoint stormwater pollution prevention.

Clark County will continue to participate in the coalition's regional awareness campaign through the remainder of the permit term.

A DES sustainability specialist will attend coalition meetings and give input on campaign content.

Educational information is on the Web at www.cleanriversandstreams.org.

Watershed Stewards Program

The Watershed Stewards Program (WS) is a partnership with Washington State University Extension. The program offers two 10-week sessions each year to train volunteers in stormwater concerns and watershed and water quality protection. The volunteers, in return, contribute to the community by educating the public at community events, leading tree plantings, conducting stream monitoring projects, and a variety of other activities and workshops.

WSU Clark County Extension will provide one full-time WS program coordinator and oversight by the Extension director. The WS program coordinator will coordinate the training sessions and work with the volunteers to propose and execute their projects. The coordinator also will attend community events to recruit new Watershed Stewards trainees. In addition, the coordinator will track the number of volunteers trained, the number of training sessions held, the number of

events staffed by Stewards, and the dollar value of volunteer hours contributed. Program effectiveness will also be evaluated.

The Environmental Services education and outreach program coordinator will track deliverables, meet regularly with the Extension director and staff, and negotiate the annual scope of work with the Extension director.

WSU Extension will submit quarterly and annual reports.

Fact sheets previously created by Extension staff will remain available on both the WSU Extension and the Clean Water Program Web sites.

Canines for Clean Water

The Canines for Clean Water program provides information to dog owners about proper management and disposal of pet waste. The program's Web page, www.cleanwaterdogs.com, provides educational information, directions for properly managing and disposing of pet waste, and a pledge for dog owners to pick up after their dogs.

The DES education and outreach program coordinator will oversee the program, and an AmeriCorps volunteer will complete the majority of the tasks, including creation of collateral materials such as calendars and a coloring book.

The AmeriCorps volunteer will distribute flyers and posters to local veterinarians; attend local community events, including dog park openings and fairs; and give presentations to community groups.

The AmeriCorps volunteer will track and respond to pledges, coordinate with veterinarians, book and staff events, and generally distribute information to the public.

Neighbors for Clean Water

Neighbors for Clean Water expands the Canines for Clean Water program by offering support and resources, such as yard signs and garbage can stickers, to neighborhood groups that want to start a grass-roots effort to promote pet waste pickup within their own neighborhoods.

The AmeriCorps volunteer will develop outreach material, attend neighborhood meetings and community events, distribute resources, and track participation.

Green Neighbors Program

Clark County will launch a new Green Neighbors program in 2012. The program, which promotes sustainable practices (including stormwater) to homeowners will be web-based, however, will host workshops and other educational events.

Web Site

The Clean Water Program operates a Web site at www.clark.wa.gov/water-resources/, as well as specific program sites, that showcase information about stormwater pollution and prevention techniques aimed at all audiences. The site also contains information on endangered species, with a redirect of www.saveoursalmon.com.

The Web site will be updated primarily by the DES education and outreach program coordinator, with assistance from technical and administrative staff as needed.

Survey of Public Knowledge

The Clean Water Program conducted a statistically valid survey of 400 county residents from November 2007 to January 2008 to measure the public's baseline understanding of stormwater problems.

The results were used to develop education and outreach campaigns, such as the Stormwater Facility Outreach, below.

A follow-up survey was conducted in early 2012 as part of the targeted neighborhood education discussed later in this section.

Publications and Displays

Environmental Services education and outreach staff will produce displays and publications generally as a part of specific program areas, such as pet waste management, natural gardening to prevent toxic runoff, pollution prevention techniques for automotive maintenance, and others.

Many displays and publications have already been produced. Staff and Watershed Stewards volunteers will continue to display and distribute them at community events, targeted environmental events, Clean Water Program presentations, Clean Water Commission meetings, and other events.

Outreach Events

Environmental Services sustainability specialists staff informational booths at a variety of community events, such as the Clark County Fair and the annual Home and Garden Idea Fair. Outreach includes information about water quality, the effects of stormwater pollution and pollution prevention.

In 2011, Environmental Services partnered with Clark County Community Development to introduce "Planet Clark", a trailer containing environmental displays, including a stormwater display. The trailer is set up at dozens of community events each year.

In 2012, Environmental Services will host a "Do It Yourself" Fair, promoting sustainable practices for homeowners, including installing pervious pavers and rain gardens.

Also in 2012, Environmental Services will reinstate and expand the Sammy Awards to recognize local citizens and organizations who work to protect the environment.

Outputs

- www.cleanriversandstreams.org, and www.caninesforcleanwater.com
- Public contacts at events
- Volunteer and community recognition event
- Workshops
- Fact sheets
- Volunteer trainings
- Pledges to pick up pet waste
- Collateral materials such as calendars, stickers, magnets, etc.
- Survey results report

Education for Businesses

Purpose

Education for businesses helps meet county goals for assisting commercial, industrial, and governmental enterprises in preventing contribution of pollutants to stormwater runoff or to receiving waters. Outreach and assistance will focus on:

- General stormwater issues.
- Information about illicit discharges.
- Preventing and controlling the discharge of contaminants through proper use of BMPs.

Responsibilities

Most activities for this requirement are conducted concurrently or in association with procedures described elsewhere in the SWMP. Responsibilities are described in their respective sections.

Clark County Green Business Program

In 2012, Environmental Services kicked off the Clark County Green Business Program (www.clarkgreenbiz.com) to recognize and promote local businesses that document "green" practices, including stormwater BMPs. The program began with a pilot of 13 Clark County businesses and will actively recruit additional participants.

Technical assistance visits and education to promote proper handling and disposal of toxic and hazardous materials and stormwater BMPs is an integral part of the program.

Outputs

- www.clarkgreenbiz.com
- Other outputs listed in relevant sections

Education for Homeowners, Landscapers, and Property Managers

Purpose

Homeowners, landscapers and property managers are caretakers for a large percentage of the county's impervious surfaces, such as roofs and driveways, as well as lawn and landscaped areas that may contribute pollutants to runoff. Education messages will focus on the following topics:

- Rural property management techniques.
- Yard care techniques.
- Proper storage and use of pesticides, fertilizers, and other chemicals.
- Proper maintenance of stormwater treatment and flow control facilities.

Responsibilities Matrix

Task	DES Sustainability & Outreach Manager	DES Ed. & Outreach Coordinator and Sustainability Specialist	DES AmeriCorps Volunteer	Agencies Providing Services
Coordinate education programs	A	P	S	C
Track and measure deliverables	A	P	S	S
Create messages, programs and collateral	A	P	P	P
Distribute messages and collateral	A	P	P	P

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Small Acreage Education Program

The Small Acreage program, funded by the Clean Water Program in partnership with WSU Clark County Extension, provides educational workshops and other outreach to residents on water quality topics unique to rural properties.

The goal of the Small Acreage (SA) program is to reduce pollution entering storm and surface water coming from residential and agricultural properties by giving residents the

knowledge and skills necessary to manage their land and animals in a way that will help keep water clean.

WSU Clark County Extension will provide one full-time SA program coordinator and oversight by the Extension director. The SA program coordinator will coordinate the workshops, training sessions, and follow-up activities. The SA coordinator also will attend community events to recruit new trainees.

The DES education and outreach program coordinator will track deliverables of the program and negotiate the annual scope of work with the Extension director.

Extension will submit quarterly and annual reports detailing deliverables.

Workshops

The Small Acreage program offers workshops throughout the year on issues of interest to rural landowners. Topics include mud and manure management, pasture management, wells and septic maintenance, and fencing for livestock.

The SA program coordinator will coordinate and give most presentations.

Living on the Land: Stewardship for Small Acreages

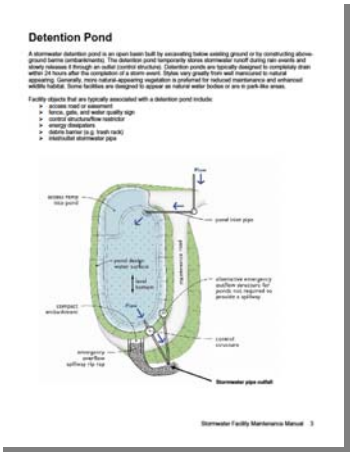
For those landowners who seek more in-depth information, the program offers a 12-week training series twice a year. During training, each participant creates a workable plan for his or her property using knowledge gained in class.

The SA program coordinator will coordinate each training and follow-up activities.

The SA program coordinator will offer "Model Farm" recognition signage to graduates who implement a plan to protect water quality on their properties.

Regulated Facility Maintenance Inspections

Clark County combines site visits for regulated stormwater facility maintenance inspection with delivery of technical assistance materials such as relevant pages from the *Stormwater Facility Maintenance Manual*. Please see Operating and Maintaining the Storm Sewer System, County Property, and Roadways on page 27 for a complete description of the process.



Targeted Neighborhood Education

As part of the stormwater program targeted BMP effectiveness monitoring requirement under permit condition S8.E, Clark County will measure the effectiveness of an education program targeting homeowners in a monitored drainage catchment.

The project will rely on stormwater quality data collected from a high density residential area for permit requirement S8.D before and after delivery of the targeted education messages.

Prior to the campaign, the DES education and outreach program coordinator will administer a behavior and knowledge survey to residents of the target neighborhood.

For at least a year prior to administering the targeted education program, the Clean Water Program will monitor stormwater composition for evidence of pesticides and nutrients in the neighborhood.

The coordinator will design an education program based on observations from the stormwater composition monitoring. DES sustainability specialists will then deliver the pesticide and nutrient reduction campaign to the targeted neighborhood.

Continued stormwater monitoring will assess levels of change in stormwater pesticide and fertilizer characteristics during and after the outreach campaign. Any changes discovered *may* be correlated to the targeted outreach messages.

The program coordinator will administer a second survey post-campaign to assess changes in understanding or behavior in the target audience compared to before the campaign.

Private Stormwater Facility Assistance & Stormwater Partners

In 2010 and 2011, Clark County joined with municipalities within the county to form the Stormwater Partners of SW Washington, a program to provide education and guidance to the public on how to properly maintain privately-owned stormwater treatment and flow control facilities. The goal of this project was to identify barriers preventing the public from doing proper maintenance and to encourage stewardship through educational materials, resources, and workshops that measurably increase awareness and help to change behaviors.

The target audiences for this effort included homeowners' associations, property managers, business owners, landscape maintenance professionals, developers, realtors, new homeowners, and neighborhood residents.

Education was delivered via web pages (www.stormwaterpartners.com), a how-to video and a user-friendly guidebook, as well as traditional outreach materials, such as

brochures, door hangers, and newsletters. The Clean Water Program education and outreach coordinator will continue to work with the Stormwater Partners to develop and implement additional activities, including workshops, in 2012.

Related Activities

Other Environmental Services programs distribute information about water quality, the effects of stormwater pollution, and pollution prevention techniques as integral parts of their program outreach and education messages to the general public.

- Naturally Beautiful Backyards curriculum delivered through a contract with WSU Clark County Extension's Master Gardeners program - less toxic gardening and yard care
- Master Composter Recyclers - less toxic gardening and yard care
- Hazardous Waste Reduction - proper disposal of household and business hazardous wastes
- Recycling A-Z Web site at www.recyclinga-z.com – proper disposal of tires, electronics and household hazardous waste

Outputs

- Fact sheets
- Workshops
- Videos
- Landowner trainings
- Stormwater facility maintenance guidebook
- Collateral materials

Education for Development and Construction Community and County Planners and Reviewers

Purpose

The individuals, businesses and agencies involved in development project planning and construction (both regulated communities and the regulators) have great influence on the impacts of stormwater from new development and redevelopment. Education to these communities will focus on the following topics:

- Technical standards for stormwater site and erosion control plans.
- Low impact development techniques.
- Stormwater treatment and flow control BMPs.

Responsibilities Matrix

Task	DES CWP Manager	DES Ed. & Outreach Coordinator	DES AmeriCorps Volunteer	DES CWP NPDES Permit Coordinator	DES CWP NRS	Comm. Dev.	PW Dev. Eng.
Code update outreach	A	S	O	P	O	I	S
Construction Management training	A	O	O	P	O	O	O
Facility inspection training	A	O	O	S	P	O	O
WWHM training	A	O	O	S	O	I	I
CD web site	O	O	O	O	O	A / P	C
Pre-application conference	O	O	O	O	O	A / P	P
Small Projects BMP handout	A	S	S	S	O	P	O
DEAB	I	O	O	O	O	I	P

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Workshops and Presentations

Code Update Training – 2009

Clark County held several training sessions after its adoption of updated stormwater and erosion control code (40.385) and the water quality code (13.26A) in 2009 for the development community and county staff. Training sessions targeted engineers and technicians, county reviewers and planners, road crew chiefs, code enforcement, and environmental permitting staff.

Public Works Construction Management Training – 2009

Public Works Construction Management personnel inspect county capital improvement construction sites and private development sites during construction. As part of ongoing training, the Clean Water Program NPDES permit coordinator presented information on the stormwater and erosion control code as well as the *Stormwater Facility Maintenance Manual*.

Stormwater Facility Inspection Training

Public Works Construction Management has an ongoing stormwater facility inspection program. Training will be provided to new inspectors or when there is a change in procedures or manual requirements.

Training on Demand

Clean Water Program staff will provide training, code interpretation, BMP manual interpretation and informational materials to technical, professional and field workers as requested.

Education Delivered Through Development Review

Many active development community stakeholders receive educational and outreach messages about stormwater and erosion control and water quality topics as an integral aspect of the regulatory development review process, including individual residential building permits.

For detailed information on the development review process, see Regulatory Program for Development, Redevelopment, and Construction Projects on page 77.

Community Development Web Site

The Clark County department of Community Development hosts a Web site devoted to compliance with erosion control measures at http://www.clark.wa.gov/development/building/erosion.html.

Pre-Application Conference

All Type II and Type III development applications require the applicant to attend a pre-application conference with county planners and engineers where, among other topics, stormwater and erosion control requirements and submittal requirements are reviewed.

Clark County Stormwater Manual

The *Clark County Stormwater Manual*, which guides applicants for development and new development through stormwater requirements and submittal requirements, contains educational messages about the importance of stormwater management.

Small Project BMP Handouts for Permit Center

Clark County provides BMP packet handouts for small projects that are required to have stormwater site plans, erosion controls and on-site stormwater management BMPs but don't require an engineered design. The target audience is mainly applicants for single family residential building permits and other small building projects.

Low Impact Development (LID) Study

With a grant from the Washington Department of Commerce (formerly Community, Trade, and Economic Development) and assistance from Cascadia Region Green Building Council, Vancouver and Clark County studied barriers to sustainable, affordable, residential development (including LID techniques) and developed strategies for removing them.

The study resulted in three reports and recommendations aimed at local decision-makers.

Development Engineering Advisory Board

The Development engineering Advisory Board (DEAB) is a technical and policy review body reporting to the Board of Clark County Commissioners. The DEAB also serves as a mechanism for coordinating with the development community and consulting engineers to distribute information and organize training.

Outputs

- Presentations
- Employee training
- Development community training
- Small Project BMP Handout
- Sustainable and affordable development reports
- Educational messages in *Clark County Stormwater Manual*

EDUCATION FOR STUDENTS

Purpose

Students will become adults who may own property, own or manage businesses, or simply live, work, and recreate in Clark County. Education for students will focus on the following topics:

- Raising awareness of the importance of clean water.
- Introducing the idea of pollutants entering water through stormwater.

Responsibilities Matrix

Task	DES Sustainability & Outreach Manager	DES Sustainability Specialist	DES AmeriCorps Volunteer	Agencies Providing Services
Coordinate education programs	A	P	S	C
Track and measure deliverables	A	P	S	S
Create messages, programs and collateral	A	P	P	P
Distribute messages and collateral	A	P	P	P
A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted				

Student Water Quality Monitoring Program

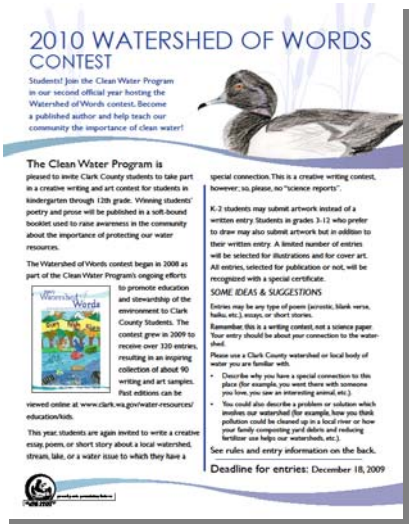
In partnership with City of Vancouver, Clark County involves K – 12th grade students in water quality monitoring of sites near their schools. Teachers and students receive mentoring in water quality and macroinvertebrate monitoring, and conduct stream studies. Students share their findings with peers and the community at an annual Student Watershed Congress.

Program activities and outreach will be conducted primarily by City of Vancouver staff. Clark County staff will negotiate the annual scope of work and track deliverables.

County staff may participate in the Student Watershed Congress as facilitators or judges.

Watershed of Words Contest

Clark County conducts a water-related writing and art contest open to K – 12th grade students each fall. Entry instructions and forms include educational messages about stormwater targeted to children and teachers.


2010 WATERSHED OF WORDS CONTEST

Students! Join the Clean Water Program in our second official year hosting the Watershed of Words contest. Become a published author and help teach our community the importance of clean water!

The Clean Water Program is pleased to invite Clark County students to take part in a creative writing and art contest for students in kindergarten through 12th grade. Winning students' poetry and prose will be published in a soft-bound booklet used to raise awareness in the community about the importance of protecting our water resources.

The Watershed of Words contest began in 2008 as part of the Clean Water Program's ongoing efforts to promote education and stewardship of the environment to Clark County Students. The contest grew in 2009 to receive over 320 entries, resulting in an inspiring collection of about 90 writing and art samples. Past editions can be viewed online at www.clark.wa.gov/water-resources/education/kids.

This year, students are again invited to write a creative essay, poem, or short story about a local watershed, stream, lake, or a water issue to which they have a special connection. This is a creative writing contest, however; so, please, no "science reports".

K-2 students may submit artwork instead of a written entry. Students in grades 3-12 who prefer to draw may also submit artwork but in addition to their written entry. A limited number of entries will be selected for illustrations and for cover art. All entries selected for publication or not, will be recognized with a special certificate.

SOME IDEAS & SUGGESTIONS

Entries may be any type of poem (acrostic, blank verse, haiku, etc.), essays, or short stories.

Remember, this is a writing contest, not a science paper. Your entry should be about your connection to the watershed.

Please use a Clark County watershed or local body of water you are familiar with.

- Describe why you have a special connection to this place (for example, you went there with someone you love, you saw an interesting animal, etc.).
- You could also describe a problem or solution which involves our watershed (for example, how you think pollution could be cleaned up in a local river or how your family composting yard debris and reducing fertilizer use helps our watersheds, etc.).

See rules and entry information on the back.

Deadline for entries: December 18, 2009

The AmeriCorps volunteer will distribute entry forms to teachers each fall and track submissions. A panel of judges including the volunteer, the education and outreach program coordinator, and at least one outside associate will review all submissions and select winners for inclusion in the *Watershed of Words* booklet. The volunteer will distribute the booklet to schools in hard-copy and to the community on the Clean Water Program Web site.

Enviroscape Presentations

Enviroscape is a hands-on presentation and demonstration of non-point source pollution geared to upper grade school and middle school students.

The Clean Water Program source control specialist will present Enviroscape to classrooms and student groups upon request. Enviroscape regularly is presented at county events such as Take Your Child to Work Day, where it provides outreach to county employees in addition to their children.

Washington Green Schools

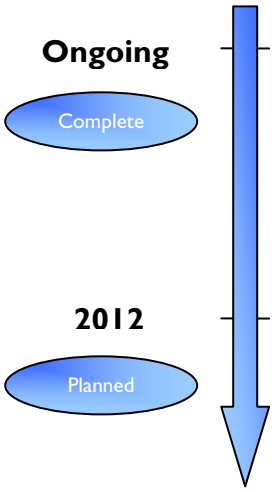
Environmental Services helped launch the statewide Washington Green Schools program. A non-profit organization now runs the program full time, with financial support from Clark County and other entities.

Schools complete assessments in five environmental categories, including water. More than 40 schools in Clark County currently participate in the program. A sustainability specialist serves on the advisory council and coordinates with Washington Green Schools.

Outputs

- Student Watershed Congress
- Watershed of Words booklet
- Enviroscape presentations
- Washington Green Schools

TIMELINE



- ✔ Educate the general public
- ✔ Educate businesses
- ✔ Educate homeowners, landscapers, and property managers
- ✔ Educate the development and land use planning community

- ❑ Increase education for homeowners, landscapers and property managers
- ❑ Measure the understanding and adoption of target behaviors for a target audience

FOR MORE INFORMATION ON PROGRAMS TO PROVIDE EDUCATION AND OUTREACH ABOUT STORMWATER AND THE SWMP

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Section 7
Coordination

Clark County coordinates internally and with other local governments and agencies on a variety of environmental and planning topics.

Regulatory Requirements Summary

NPDES Permit S5.C.3 – Coordination

The NPDES Permit requires the county to coordinate among its own departments and with neighboring jurisdictions to eliminate barriers to permit compliance and to encourage coordinated stormwater policies, programs and projects within a watershed.

County Policies, Rules and Regulations

The following policies and regulations promote permit implementation by county departments.

Executive Direction

In 2008, County Administrator Bill Barron directed the departments of Community Development, Community Planning, General Services, Public Works, the Endangered Species Act Office, and Vancouver-Clark Parks and Recreation to comply with the county's NPDES Phase I Municipal Stormwater Permit. The directive refers to activities that are directly regulated by the permit and to activities conducted to support the county's water quality protection goals.

Clark County Code Chapter 13.26A – Water Quality

Chapter 13.26A requires inspection and maintenance of all public and private stormwater facilities and stormwater disposal wells in accordance with the *Stormwater Facility*

Maintenance Manual, and adopts the *Clark County Stormwater Pollution Control Manual* that provides source control BMPs for materials handling, landscape management, trash management and building exterior maintenance. Both of these manuals are equivalent to maintenance standards in Volume V and source standards in Volume IV of the *SMMWW*.

Environmentally Responsible Purchasing Policy

Clark County adopted its Environmentally Responsible Purchasing Policy in 2004. One element addresses purchase of landscaping and vegetation maintenance products, including pesticides. The policy establishes a set of criteria, any of which will disqualify a pesticide from purchase. A waiver process requires further examination of the pesticide by the Environmentally Responsible Purchasing Team to determine if a more environmentally-friendly alternative exists. If no alternative is found, the pesticide can be purchased and used within specific limiting guidelines. The policy promotes a coordinated approach to the pesticide and fertilizer use reduction.

Regional Road Maintenance Program

Clark County Public Works has been a member of the ESA Regional Road Maintenance Forum since 2003. The group assisted the county in developing a Regional Road Maintenance Program that is designed to meet the requirements of the Endangered Species Act (ESA). In 2004, NOAA Fisheries approved Clark County's Regional Road Maintenance Program and determined that it was compliant with the ESA. The program seeks to protect salmon and steelhead by relying on the extensive use of pre-approved BMPs for routine maintenance activities. The program promotes systematic adherence to pollution control standards for road operations.

Intra-governmental Coordination

Purpose

Intra-governmental coordination helps ensure cooperation of all Clark County departments in meeting the terms of the NPDES Municipal Stormwater Permit and in protecting local water resources.

Responsibilities

Responsibility for negotiating interdepartmental and programmatic agreements lies with the Clean Water Program manager or a designee and with managers of coordinating programs and departments.

Responsibilities for implementing the agreed-upon activities are shown in detail in responsibility matrices and program descriptions in the appropriate sections.

Agreements

The Clean Water Program coordinates the county's NPDES Permit compliance efforts. Although the program coordinates with other departments, it is not responsible for all compliance actions. The Clean Water Program maintains memoranda of understanding or other agreement mechanisms with several county departments to support compliance. Agreements include services provided for payment by the CWP and description of permit requirements that must be met by departments.

Public Works Road and Parks Maintenance Division

Public Works completed an intra-departmental agreement between the Clean Water Program and the Road and Parks Maintenance Division to implement requirements under permit requirements S5.C.9, Operations and Maintenance Program, including:

- Standards and schedules for stormwater facility and catch basin maintenance.
- Practices for operating streets, roads, and highways.
- Spill response practices.
- Private facility inspection and enforcement.
- Water quality BMPs for maintaining public land.
- Training.
- Stormwater Pollution Prevention Plans (SWPPs) for heavy equipment yards.
- Record keeping.
- Reporting requirements for the NPDES Permit annual report.

Public Works Transportation and Development Engineering Division

Under an informal agreement, Public Works has been providing development review and inspection services for enforcing Clark County Code Chapter 40.385 Stormwater and Erosion Control and its predecessor, Chapter 40.380, since 2008.

Public Works provides the following services:

- Review and approval of development project applications
- Administration of development project record keeping

Public Works Engineering and Construction Division

Under and informal agreement, Public Works provides services to implement permit requirements under S5.C.6 and S5.C.7.

Public Works provides the following services:

- Project management for stormwater capital improvements.
- Design and construction management for stormwater capital improvements.
- Capital planning assistance.
- Development site inspection.

- Program to inspect stormwater facilities during maintenance warranty.
- Enforcement of inspections.
- Inspection program record keeping
- Source control inspections and follow-up.
- Regulated stormwater facility inspection follow-up.

Community Development

Department of Environmental Services maintains an interdepartmental agreement with Community Development to implement requirements under permit requirement S5.C.5, including:

- Accept development applications.
- Review site plans for residential building projects that do not require engineered designs.
- Review and inspect erosion controls, on-site stormwater controls at residential building sites, primarily single-family residential construction sites.
- Enforce stormwater, erosion control, and water quality codes.
- Maintain records of applications, reviews, inspections and enforcement actions.

GIS Department

Department of Environmental Services maintains an agreement with the GIS Department for various services that support SWMP implementation, including administration of the county's storm sewer infrastructure asset database, *StormwaterClk*, stormwater fee database administration, software support, GIS data used for capital planning and monitoring studies, developing Web applications and internet access to program information, and database development.

Other Intra-governmental Coordination

The Clean Water Program also coordinates informally with other county programs and departments on various stormwater-related and environmental efforts.

General Services

The Clean Water Program provides outreach and coordinates with the General Services department to aid implementation of water quality BMPs for building exterior maintenance on various county properties.

Public Health

The Clean Water Program routinely coordinates with Public Health on spill responses, illicit discharge investigations, and other environmental complaints.

Outputs

- Interdepartmental memoranda of understanding for services and permit requirements performed

INTERGOVERNMENTAL COORDINATION

Purpose

Clark County informally coordinates with Phase II permittees and other local organizations to control pollutants between physically interconnected storm sewer systems, to attempt to provide consistent stormwater management for shared water bodies, and to collaborate on TMDL compliance.

Responsibilities Matrix

Task	DES Director	DES CWP Manager	DES NPDES Permit Coordinator	DES NRS III
VLWP Steering Committee rep.	A	P	O	S
VLWP TAC representative	A	S	O	P
Provide input to TMDL DIPs	O	A	S	P
TMDL advisory committees rep.	O	A	S	P
WRIA Planning coordination	A	P	S	S

Coordination to Clarify Roles and Responsibilities for Interconnected Systems

The Clean Water Program has identified approximately 540 connection points between the county MS4 and other municipal entities such as cities and WSDOT right of way. The Clean Water Program assesses the potential for intersystem pollutant discharges using IDDE procedures.

Clark County has informal discussions with NPDES Phase II permittees regarding mapping and illicit discharge screening programs. Clark County plans to develop a more formal agreement during the permit term.

General Intergovernmental Coordination

Clark County participates with other local governments and agencies on several joint efforts, including:

- Shared education and outreach programs with the city of Vancouver

- A regional education program covering facility maintenance to stormwater facility owners with Vancouver, Battle Ground, Camas, Washougal, Ridgefield, and La Center
- Operation of the regional street waste decant facility with WSDOT, Vancouver, Battle Ground, Camas, and Washougal

Coordination for Shared Water Bodies: Vancouver Lake Watershed Partnership

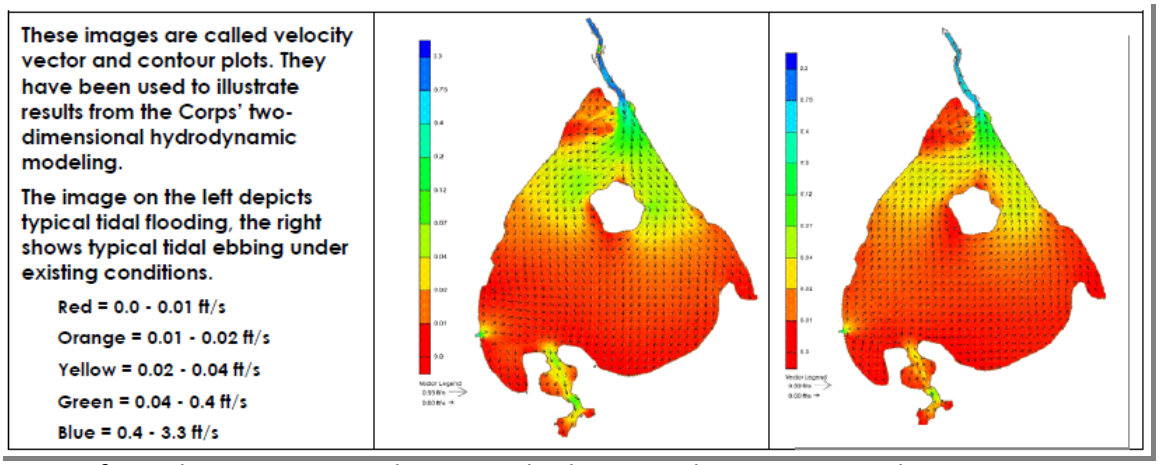
The Vancouver Lake Watershed Partnership (VLWP) was established through an intergovernmental agreement between the Port of Vancouver, the city of Vancouver, Clark County, and Vancouver-Clark Parks and Recreation.

Other participants include the Fruit Valley Neighborhood Association, the Port of Ridgefield, Clark Public Utilities, Washington Department of Fish and Wildlife, Washington Department of Natural Resources, Washington Department of Ecology, the U.S. Army Corps of Engineers, the Lower Columbia River Estuary Partnership, and nine citizen members.

The partnership was formed to consider the community vision and strategies for the future of Vancouver Lake.

Clark County will continue to act as the financial manager for the partnership.

The Clean Water Program will continue to provide one representative to the Steering Committee – the Clean Water Program manager – and one representative to the Technical Advisory Committee, a NRS III.



Images from the Vancouver Lake Watershed Partnership 2008 Annual Report

TMDL Coordination

Clark County coordinates with other local entities on TMDL implementation. Upon request, the NPDES permit coordinator will provide input to Ecology in development and update of Detailed Implementation Plans. One NRS will continue to participate on the local advisory committees for the following existing or emerging TMDLs:

- Burnt Bridge Creek Watershed
- East Fork Lewis River
- Gibbons Creek
- Salmon Creek

Clark County complies with TMDL requirements by implementing its Stormwater Management Program.

Shoreline Master Plan

The State Shoreline Management Act requires counties and cities to update their Shoreline Master Programs (SMPs) for Ecology review by December 1, 2011. SMPs contain goals, policies, and regulations that govern activities on and near lakes, streams, and rivers. Most local SMPs date from the 1970s, and must be modernized to reflect today's conditions and address new state requirements, including stormwater regulations.

Water Resources Inventory Area (WRIA) Planning

The Environmental Services Policy and Planning Division Manager will coordinate with Ecology, the Lower Columbia Fish Recovery Board and local partners for WRIA plan development and implementation for WRIA 27 and WRIA 28. Goals of the WRIA plan include improving stream habitat and low flows, which are compatible with stormwater program objectives and actions.

Outputs

- various outputs from education and outreach programs (see section 6)
- Vancouver Lake Watershed Partnership annual reports
- Technical reports from the VLWP Technical Advisory Committee
- Reports from scientific studies commissioned by the VLWP
- Notes and summaries from each TMDL's Advisory Committee meetings
- Shoreline Master Plan development and implementation input from Clark County
- WRIA Plan development and implementation input from Clark County

For more information on ways the county coordinates with other jurisdictions and permittees

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Chapter 3
Assessment and Monitoring

County staff monitoring water quality

Assessment and Monitoring

Clark County is a regional leader in natural resource monitoring and assessment. The Assessment and Monitoring section implements a variety of projects to collect scientific data about stormwater, surface waters, stream corridor condition, and habitat.

The core goal is to provide information leading to successful on-the-ground actions that improve natural resources in Clark County. The program utilizes sound science and data collection practices to inform the county's policy and program management decisions, provide information vital to the success of Clark County programs, and support the work of numerous outside agencies, professionals, schools, and citizens.

Assessment and Monitoring projects are an integral part of the overall Clean Water Program, providing direct compliance with, and indirect support for, numerous requirements under the County's municipal stormwater permit.

Regulatory Requirements Summary

NPDES Permit – S8 Monitoring

The NPDES Permit requires the county to develop and implement a long-term monitoring program with three components: 1) characterize stormwater runoff quantity and quality, 2) monitor stormwater management program effectiveness by evaluating two

stormwater management practices, and 3) evaluate the effectiveness and operation and maintenance requirements of a stormwater treatment or a hydrologic management BMP.

NPDES Permit – S5.C.5 Controlling Runoff from New Development, Redevelopment and Construction Sites

The NPDES Permit allows flow control regulations for controlling runoff on development sites to be tailored to local circumstances through the use of basin plans. The alternate requirements must provide equal or similar protection of receiving waters and equal or similar levels of pollutant control as compared to Appendix 1 of the permit.

County Policies, Rules and Regulations

Clark County Code Chapter 40.385 – Stormwater and Erosion Control

Clark County regulates stormwater runoff and erosion control on development, redevelopment, and construction sites in Chapter 40.385 Stormwater and Erosion Control. The purpose of the code is to safeguard public health, safety, and welfare by protecting the quality of surface and ground waters for drinking water supply, recreation, fishing and other beneficial uses through the application of BMPs for stormwater management and erosion control. It was adopted to minimize the degradation of receiving waters from impacts attributable to stormwater runoff, thereby not precluding the preservation of future restoration of beneficial uses.

At present, the code applies flow control regulations equally across all subwatersheds in the county. It allows flow control requirements to be tailored on a local basis through the adoption of basin plans.

Stormwater Facility Maintenance Manual

Clark County Code Chapter 40.385 requires that all new stormwater treatment and flow control facilities be maintained according to the standards in Clark County's January 2009 *Stormwater Facility Maintenance Manual*. The manual is also applied to all existing facilities under Chapter 13.26A. The *Stormwater Facility Maintenance Manual* adopts maintenance standards for public and private stormwater facilities equivalent to the *SMMWW*.

Tools

Stormwater Needs Assessment Program

Assessment and Monitoring uses the Stormwater Needs Assessment Program (SNAP) as an organizing framework for many of its activities.

The *Stormwater Needs Assessment Program Volume I* describes the purpose, strategy, procedures, tools, and outputs of the SNAP.

The SNAP is a systematic subwatershed-based approach to conducting assessment and monitoring activities, with an emphasis on developing inputs for stormwater capital planning (see County Stormwater Capital Improvements on page 62). A variety of assessment and monitoring tools are applied as appropriate to each subwatershed in the county. The SNAP runs on a five-year cycle; the initial five-year cycle concluded in March 2011, and produced thirty-five SNAP reports covering 68 county subwatersheds.

During the first half of 2011, Assessment and Monitoring will revise the SNAP in preparation for a second five-year cycle beginning in mid-2011 and continuing through 2015. A SNAP scope of work detailing the use of various assessment tools, geographic coverage, and staff assignments is developed for each implementation year.

SNAP reports summarize the assessment and monitoring tools utilized in each subwatershed. Problems are identified and lists of opportunities are compiled for capital planning evaluation, internal referrals, and management recommendations.

The SNAP project manager is a lead Natural Resource Specialist (NRS) in the Clean Water Program. The SNAP project manager assigns lead staff to each subwatershed (or group of subwatersheds) from among the Clean Water Program NRSs. The SNAP project manager schedules overall assessment activities and assigns project staff for individual tool implementation. Each subwatershed lead oversees report-writing for his/her assigned basins.

Standard Procedures for Monitoring Activities

The Clean Water Program maintains the *Standard Procedures for Monitoring Activities* for use in guiding field and laboratory work. It details the protocols and means used to generate data.

Water Quality Database

The *Water Quality Database* (WQDB) is a centralized repository for the Clean Water Program's water quality and benthic macroinvertebrate data. The WQDB is a SQL 2000® database with Access® interfaces for data entry and retrieval. A batch uploading tool enables rapid entry of large datasets.

Capital Planning Database

The *Capital Planning Database* is an integrated data management system for tracking information about stream problems and project opportunities from discovery through implementation. The tool is a SQL 2000® geodatabase with two interfaces: 1) an Access® interface for tracking data relating to stormwater capital projects and 2) an

ArcMap® interface for photos and data relating to stream problems and project opportunities.

Hydrology Databases

Data from the county's hydrologic monitoring network (stream flow and rainfall gages) is stored in a Sutron® database, from which provisional data is available on the web. Permanent data records are maintained on county servers.

Hydrology data generated by stormwater monitoring projects is stored in an Access® database using an ISCO Flowlink® interface.

Assessment Activities

Drainage System Inventory and Condition

Purpose

Drainage system condition is assessed based on three components:

- An evaluation of retrofit opportunities at stormwater facilities
- An inspection and evaluation of maintenance at stormwater facilities
- An off-site assessment to check for outfall-related impacts in downstream receiving waters

The evaluations identify potential opportunities to retrofit existing facilities for increased treatment or control of stormwater runoff; help assess the level to which ongoing inspection and maintenance is meeting state maintenance standards; and document localized stream impacts from county stormwater outfalls.

Method

Drainage system assessments are conducted in each subwatershed during the permit cycle.

Evaluation of retrofit opportunities and maintenance condition are conducted at all stormwater facilities that contain detention ponds, treatment wetlands, wet ponds, pre-settling cells, open filters, or bioswales. Assessments of downstream conditions (called off-site assessments) are conducted at priority outfalls discharging to landslide hazard areas and other mapped critical areas. Assessments are made according to standards in the *Stormwater Facility Maintenance Manual*.

Non-compliant facilities are referred to Public Works Operations for inspection and maintenance. Facilities that have potential to provide greater treatment or flow control benefit through retrofitting are referred to Clean Water Program engineers for evaluation (see County Stormwater Capital Improvements on page 62).

Outputs during the Permit Term

- Potential repair or retrofit project referrals to capital planning
- Maintenance referrals to Public Works Operations
- Summary chapters for SNAP reports

Outcomes during the Permit Term

- Six repair or retrofit project opportunities are scheduled for construction within the permit term, with another three scheduled for 2012 construction
- A comprehensive stormwater facility inspection tool was developed by Assessment and Monitoring staff and is being implemented in the county's asset management system

Stream Assessment

Purpose

Stream assessment includes two activities that evaluate the physical condition of stream channels and riparian areas.

Geomorphology Assessments place watershed and stream corridor conditions into a geomorphic context by evaluating sediment delivery, channel form, and channel stability. The assessments focus on developing an understanding of how land use and geomorphic processes in a subwatershed have impacted, and will continue to impact, channel morphology, flooding, erosion, water quality, and habitat. Results of geomorphology assessments are a primary input for basin planning (see Other Functions on page 141) and provide context for evaluating capital project opportunities.

Feature Inventories characterize stream corridor conditions at the stream reach scale. Inventories record the type and location of notable features related to human alterations, highlighting areas that are impaired with respect to channel processes, erosion, stormwater infrastructure, and water quality. Feature inventories provide an opportunity to document significant conditions that are often unidentifiable through desktop methods. Results are a source of stormwater capital project opportunities (see Capital Planning on page 62).

Method

Geomorphology Assessment

Targeted stream reaches are walked and the following data are recorded:

- Bankfull channel width and depth
- Channel gradient
- Substrate conditions
- Sinuosity

- Large woody debris
- Channel type
- Channel stability
- Bank conditions
- Floodplain conditions
- Floodplain width
- Floodplain connectivity

Field data are reviewed along with available information about the subwatershed, including geology, soil types, topography, impervious cover, and utility alignments.

The channel network is delineated into reaches and each reach is assigned a response potential. The response potential is a qualitative classification describing the likelihood that a reach will experience future channel degradation as a result of hydrologic changes.

Feature Inventory

Targeted stream reaches are walked and the following information recorded:

- Aggradation
- Access points
- Channel modifications
- Severe erosion
- Impacted stream buffers
- Impacted wetlands
- Barriers
- Stormwater outfalls
- Stream crossings
- Trash and debris
- Utility impacts
- Water quality impacts

A GPS position, one or more digital photos, and relevant attribute information are recorded for each logged feature. Additional data may be collected at selected stream crossings in subwatersheds where stream reaches are not walked.

Outputs during the Permit Term

- Characterization chapters for SNAP reports – geomorphology and stream reconnaissance
- Data input to the *Capital Planning Database*

- stream miles inventoried

Outcomes during the Permit Term

- Six stormwater capital improvement projects planned for construction within the permit term
- Streamside trash dumps removed

TRASH REMOVAL LEADS TO CLEANER STREAMS

From 2006 through 2009, Feature Inventory assessments documented nearly 100 streamside trash dumps of varying sizes and materials. Some of these were on public land; however, 80 percent were on private land.

Taking the lead in cleaning up the trash sites, the Clean Water Program coordinated with custodial county departments to clean up many sites found on public land next to streams.

For sites on private land, the Clean Water Program sent 65 letters to landowners pointing out the problems and requesting their cooperation in removing trash. Eleven landowners have responded to report that they have cleaned up their sites. Others may have cleaned up their streamside trash dumps without notify the county.

The county also worked with Salmon Creek Watershed Council and the Boy Scouts, who recruited volunteers to remove almost 24 cubic yards of debris and trash from stream banks on some private properties. The county provided trash off-haul for these efforts.

Over the course of three years, trash from more than 30 streamside dumps was removed as a result of these efforts.

Monitoring Activities

Stormwater Monitoring

Purpose

Stormwater monitoring includes three projects that address an ongoing need for information about the quality of stormwater stemming from different land uses, the effectiveness of specific stormwater facilities in controlling flow and pollutants, and the ability of management activities to improve stormwater quality.

Stormwater Characterization is a long-term project evaluating stormwater quality from commercial, high-density residential and low-density residential areas. The project focuses on identifying seasonal, inter-annual, and long-term changes in pollutant loading and stormwater quality.

Best Management Practice Effectiveness Monitoring is a short-term project evaluating several stormwater treatment BMPs. The project includes two treatment wetlands, a Low Impact Development site that uses pervious pavement, and a treatment train including a bioswale and media-filter cartridge vault. The project focuses on quantifying the effectiveness and maintenance needs of several treatment mechanisms, including simple gravity settling of particulate pollutants, filtration, biological uptake, and soil adsorption.

Stormwater Management Program Effectiveness Monitoring is a long-term project evaluating the impact of a targeted education program on stormwater quality. The project utilizes stormwater characterization project data from a high-density residential area to quantify differences in stormwater quality following an education campaign to decrease pesticide and fertilizer use in the neighborhood surrounding the study site.

Method

Stormwater monitoring utilizes sophisticated automatic sampling equipment and technology to collect data and samples from targeted locations. The county has made a significant investment in the installation of stormwater monitoring stations, including data recorders, sensors, telemetry equipment, and water/sediment samplers that are programmed to operate during targeted storm and runoff events.

Flow-weighted composite and grab samples are collected during baseflow and qualifying storm events for chemical analysis. Continuous flow data is collected to calculate pollutant loads. Additional water and sediment samples are collected for characterization and toxicity testing during first-flush storm events.

Outputs during the Permit Term

- Calculated pollutant loads and load reductions
- Calculated sediment accumulation rates
- Management recommendations for facility maintenance
- Public survey results
- Annual Stormwater Monitoring Report to Ecology

Crews install a weir at a wetland BMP monitoring site

Long-term Stream Monitoring

Purpose

Long-term stream monitoring includes three projects that address an ongoing need for information about the physico-chemical, biological, and hydrological health of Clark County streams.

The **Long-term Index Sites (LISP)** project is a primary source of water quality information for the *Clark County Stream Health Report*, published most recently in

2010. Data from this project are used to characterize current water quality, detect long-term trends, and assess the degree to which stormwater influences stream water quality.

The **Benthic Macroinvertebrate** monitoring project is the primary source of biological information for the *Clark County Stream Health Report*. Data from this project are used to characterize current biological health, detect long-term trends, and assess the degree to which stormwater influences stream biota. Benthic macroinvertebrate monitoring is among the most powerful tools for assessing stream condition, providing an integrated assessment of many factors by focusing on organisms that reside in streams over a large portion of their lifecycle.

The **Hydrology** monitoring project is the primary source of streamflow information for the *Clark County Stream Health Report*. Hydrology data is used to assess stormwater runoff impacts, aid in interpreting water quality data, provide inputs for basin planning models, and support capital planning. Engineering professionals routinely use the rain and streamflow data for designing stormwater infrastructure at development sites.

Method

Long-term Index Sites

Monthly water quality samples are collected at ten stations county-wide. Samples are analyzed for a suite of parameters used to calculate the Oregon Water Quality Index (OWQI). Temperature loggers are deployed annually from May through

SALMON CREEK SUCCESS

Since 1995, Clark County's Clean Water Program, Clark County Public Health, Clark Public Utilities, the Clark Conservation District, and Washington Department of Ecology have partnered to improve turbidity and bacteria problems in Salmon Creek.

In 2009, Ecology analyzed recent Clark County data and compared it to conditions in the 1990s. The result? All long-term monitoring locations in Salmon Creek now meet water quality standards for turbidity, and fecal coliform bacteria has decreased by up to 98% in some locations. Reduced nutrient levels (phosphorus and nitrogen) were also found in most locations.

How did we do it? Improved stormwater management, streamside tree planting, habitat restoration, public education, monitoring, and improved septic system oversight have resulted in measurable improvements in water quality. With time, resources, and most importantly, the help of committed agencies, stakeholders and residents, it can be done!

View the entire report at:
http://www.ecy.wa.gov/biblio/0903042.html

Learn more about the unique TMDL:
http://www.ecy.wa.gov/programs/wq/tmdl/SalmonCr/SalmonCr.html

September. Temperature data are analyzed for comparison with Washington water quality standards.

Benthic macroinvertebrates

Annual macroinvertebrate samples are collected during August at the ten LISP stations and additional stations identified in SNAP subwatersheds for a given year. Samples are analyzed for a suite of sub-metrics used to calculate the Benthic Macroinvertebrate Index of Biological Integrity (B-IBI).

Hydrology

Data are collected from 10 stream flow gages and seven precipitation monitoring stations throughout unincorporated Clark County by automated recording equipment. Stream discharge is calculated for every 15-minute stage value and compiled into mean, minimum, and maximum daily discharge. Provisional real-time stream flow and precipitation data are available in tabular and graphic formats on the Clean Water Program web site. Final annual data are also posted.

Outputs during the Permit Term

- 2010 *Clark County Stream Health Report*
- 2007 *Clark County Water Quality Trends* report
- Water quality and macroinvertebrate data (15,000 measurements made from 2007-2010)
- Continuous temperature data (40 deployments 2007-2010)
- Continuous flow and rainfall data (60 stream flow and 32 precipitation annual datasets 2007-2010)
- Summary chapters (water quality and macroinvertebrates) for SNAP reports (70)

Outcomes during the Permit Term

- Real-time hydrology data available on the Internet
- Hydrology models developed for Salmon Creek, Mill Creek, Curtin Creek, and Whipple Creek using county data
- 2010 *Clark County Stream Health Report* available to citizens on the internet and CDs
- Monitoring data requests fulfilled

Focused Water Quality Studies

Purpose

Focused studies are one-year investigations that address two kinds of data gaps:

1. Projects characterize overall water quality in subwatersheds where data are lacking. These projects typically involve monthly sampling for the same parameters as the LISP, at one or two locations in each of several subwatersheds.
2. Projects collect detailed, short-term information about a known water quality issue. These projects typically focus on fecal coliform bacteria, turbidity, or temperature, and are often conducted to address potential source areas for TMDL implementation. SNAPBACT projects involve monthly or twice-monthly sampling for one or two parameters of interest, usually at a number of locations spaced relatively closely within a single subwatershed.

Since 2007, the Clean Water Program has also concluded two longer-term lake studies.

Outputs during the Permit Term

Completed projects during the permit term:

- *Gee Creek Focused Assessment: Fecal Coliform and Turbidity* (2007)
- *Salmon Creek Focused Assessment: Fecal Coliform and Turbidity* (2008)
- *Lacamas Lake Monitoring Summary* (2007)
- *Vancouver Lake Monitoring Summary* (2007)
- Morgan Creek characterization study (2008)
- Lakeshore characterization study (2009)
- West Slope characterization study (2012)

Illicit Discharge Monitoring

This activity is covered in detail in Illicit Connections and Illicit Discharges Detection and Elimination (IDDE) on page 52).

Other Functions

Basin Planning Studies

Purpose

Basin planning is the technical and policy process by which Ecology recommends tailoring state standards to local conditions. Under the NPDES permit, basin planning may be used to tailor minimum requirements #6 (Runoff Treatment), #7 (Flow Control), and #8 (Wetlands) in *Appendix 1 Minimum Technical Requirements for New Development and Redevelopment*. Section 4.7 Flow Control states that alternative flow control requirements may be established through watershed-scale hydrological modeling and supporting field observations.

The goal of basin planning in Clark County is to develop appropriate alternative flow control standards in selected basins that are tailored to basin-specific conditions, protective of existing and desired beneficial uses, and approvable by Ecology.

Method

The development of alternative flow control standards relies on basin-wide hydrologic models, coupled with detailed hydraulic modeling and sediment transport calculations carried out at representative reaches. Technical analysis at each detailed study reach includes a geomorphic assessment, a hydrologic assessment, and a hydraulic assessment to provide an integrated understanding of the historic, current, and projected fluvial processes at work. Alternative flow control standards are then recommended based on the combined results of these analyses.

Technical analyses are submitted to Ecology for approval. Policy options are then drafted for presentation to the BOCC. Code revision or basin plan adoption may follow, at the discretion of the BOCC.

Clark County began developing an alternative flow control standard for the Mill Creek subwatershed in 2009. Fieldwork and technical analyses were completed in early 2010. The technical report and recommended alternative standards are under review by Ecology.

Outputs during the Permit Term

- *Alternative Flow Control Standard for the Mill Creek Basin* (May 2010)
- Model outputs (e.g. flow duration curves)
- Reports or memorandum on policy options

Stream bed stability testing in the Mill Creek subwatershed, 2009

Monitoring Resource Center

Purpose

The Monitoring Resource Center provides training, monitoring equipment, and project guidance to volunteers who wish to monitor water bodies in Clark County. The program loans sampling equipment and professional-grade field meters. Staff scientists help refine volunteer project plans to make sure that the field data will be able to answer the project's questions.

Method

Staff assemble, calibrate, and track equipment on loan to qualified borrowers.

Outputs during Permit Term

- Log of Monitoring Resource Center borrowers
- Log of data requests

Outcomes during Permit Term

- Equipment checkouts to individuals, agencies and groups

For more information on services provided by the Assessment and Monitoring section

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SWMP Capital Projects List

Program	Project Name	Project Number	Description	Flow Control Restoration to Historic: Water Quality Benefit (tons TSS reduction/yr)	Lawn	Pasture	Impervious	Hydrology Benefit (% reduction in 2-yr flow)	Other Environmental Benefits	Estimated Cost	Actual Cost	Project Status	Completion Year
Structural Stormwater Control	Cougar Creek Infiltration Project	400119	Install a series of dry wells in the vicinity of NW 12 Ave along NW 88th Street, Westgate St, and Westridge St. There will be a total of 30 dry wells installed altogether under this project primarily to capture and infiltrate the road runoff.	0	0	0	0	0	TBD	$369,339	$369,339	Complete	2003
Structural Stormwater Control	I-205 Stormwater Facility	400117	Construct new biofiltration swales along I-205 near Salmon Creek crossing to treat the runoff from I-205 before it gets discharged to Salmon Creek.	0	0	0	0	0	TBD	$0	$179,692	Complete	2003
Structural Stormwater Control	LaLonde Creek SWF	392312	Add water quality and flow control for subdivision draining to LaLonde Creek in Salmon Creek watershed.	0	0	0	0	0	TBD	$919,809	$919,809	Complete	2003
Structural Stormwater Control	Salmon Creek/HWY 99 SWF	400116	Construct a stormwater filter vault with 26 cartridges to capture and treat runoff from HWY 99 south of Salmon Creek.	0	0	0	0	0	TBD	$105,646	$105,646	Complete	2003
Structural Stormwater Control	Thomas Lake Wetland	400110	Expand the existing wetland to improve habitat, water quality treatment, drainage, and flow control. On the east side of the property, new grading will yield a large, deep water sedimentation pond. The pond will receive water from the drainage ditch and route it through a meandering path with varying depths and vegetation to a new outlet pipe at the northwest corner of the site.	0	0	0	0	0	TBD	$0	$427,215	Complete	2003
				0	0	0	0			Sub Totals: $1,394,794	$2,001,701		
Structural Stormwater Control	Bliss Road/NW 36th Avenue SWF	400280		0	0	0	0	0	TBD	$29,436	$29,436	Complete	2004
Structural Stormwater Control	Upper Suds Creek Stormwater Facility	400279	Widen the existing channel to reduce velocity of the incoming flow. This will enhance the settlement of particulates out of the incoming runoff. Modify the outlet control structure to maximize the ammount of detention achieved by the stormwater facility.	0	0	0	0	0	TBD	$92,549	$92,549	Complete	2004
				0	0	0	0			Sub Totals: $121,985	$121,985		
Structural Stormwater Control	Salmon Creek/HWY 99 North Storm Water Facility	400281	Install a storm filter vault with 99 filter cartridges to treat the runoff from HWY 99.	0	0	0	0	0	TBD	$746,033	$746,033	Complete	2005
				0	0	0	0			Sub Totals: $746,033	$746,033		
Structural Stormwater Control	North Gabbert Clean Water Mitigation (Carrie Otter Wetland)	400291	Excavate the existing wetland to create a new wetland enhancement area in a headwaters area tributary to Mill creek. The proposed design will also incorporate water quality treatment through a two cell wet pond and will also have a flow control arrangements.	0	0	0	0	0	TBD	$644,036	$644,036	Complete	2006

Program	Project Name	Project Number	Description	Flow Control Restoration to Historic: Water Quality Benefit (tons TSS reduction/yr)	Lawn	Pasture	Impervious	Hydrology Benefit (% reduction in 2-yr flow)	Other Environmental Benefits	Estimated Cost	Actual Cost	Project Status	Completion Year
				0	0	0	0		Sub Totals:	$644,036	$644,036		
Structural Stormwater Control	Clark County Parking Lot Rain Garden Project	000000	Construct a rain garden to replace the existing grassy swale. The facility will capture and treat the runoff from 1.3 acres of parking lot impervious area.	0.07	0	0	0	0	Improve aesthetics and provide urban habitat	$0	$57,309	Complete	2008
Structural Stormwater Control	Curtin Creek Enhancement Area	400580	Construct meandered stream channel and excavate flood plain bench increasing flood storage/retention. Reconnect the stream to the floodplain, enhance and create wetlands and habitat that provide multiple water resources and environmental benefits.	0	0	0	0	12	Improve aesthetics and nearly 30 acres of wetland/riparian habitat	$3,801,776	$3,688,351	Complete	2008
Structural Stormwater Control	NE 113th Ave Curb Extension Project	000000	Construct two curb extension planters on either side of NE 113th Ave to capture and treat the road runoff.	0.04	0	0	0	0	Improve aesthetics and groundwater recharge	$0	$9,884	Complete	2008
Repair	Whipple Creek Meadows SWF Repair	400901	Retrofit the existing grassy swale to get rid of sink holes along the swale.	0	0	0	0	0		$0	$37,537	Complete	2008
				0.11	0	0	0		Sub Totals:	$3,801,776	$3,793,081		
Structural Stormwater Control	NE 76th Street Water Quality Project	400895	Install a series of catch basin storm filter cartridges along NE 76th Street between NE 94th Ave and NE 89th Ave.	0.5	0	0	0	0		$0	$130,294	Complete	2009
Structural Stormwater Control	NE Hazel Dell Avenue Water Quality Project	400893	Install a series of catch basin storm filter cartridges along NE Hazel Dell Ave to the south of NE 99th Street.	0.6	0	0	0	0		$160,202	$160,202	Complete	2009
Structural Stormwater Control	NE Minnehaha Street Water Quality Project	400894	Install a series of catch basin storm filter cartridges along NE Minnehaha Street between St. Johns Rd and NE 48th Ave.	0.7	0	0	0	0		$0	$101,839	Complete	2009
Repair	Norta Vista Subdivision SWF Retrofit	401661	Reconstruct the existing bioswale to provide water quality treatment and install an energy dissipater at the inlet to stop erosion.	0	0	0	0	0		$56,000	$55,183	Complete	2009
Structural Stormwater Control	Quail Park Storm Water Facility Project - Phase I	400834	Install a flow control structure to divert overflow water from Quail Park SWF through the wetland to reduce erosion in South Whipple Creek tributary.	0	0	0	0	0		$0	$84,964	Complete	2009
Structural Stormwater Control	Vancouver Toyota LID Project	007251	Install eco-stone permeable interlocking concrete pavers within approximately 7.66 acres of parking lot of Vancouver Toyota to treat and infiltrate runoff from approximately 10.33 acres of drainage area. Vancouver Toyota owns the site and will be primarily responsible for construction and maintenance of this facility. County will subsidize for a portion of the installation cost.	0	0	0	0	0		$0	$150,000	Complete	2009
				1.8	0	0	0		Sub Totals:	$216,202	$682,482		
Structural Stormwater Control	Felida Knolls SWF Retrofit	401660	Convert existing bio-swale/pond facility to stormwater wetland to improve water quality treatment.	0.5	0	0	0	0	Improve aesthetics	$114,447	$118,479	Complete	2010

Program	Project Name	Project Number	Description	Flow Control Restoration to Historic					Other Environmental Benefits	Estimated Cost	Actual Cost	Project Status	Completion Year
				Water Quality Benefit (tons TSS reduction/yr)	Lawn	Pasture	Impervious	Hydrology Benefit (% reduction in 2-yr flow)					
Flow Control Mitigation Program	Hawks Pointe SWF Retrofit	401884	Modify an existing stormwater facility to provide better water quality treatment and additional detention storage. Install a standard flow control structure and large bio-retention swale to treat the runoff in accordance with county's current standards.	0.1	3.8	0	1.2	96	Improve aesthetics	$152,869	$240,738	Complete	2010
Flow Control Mitigation Program	Lakeshore & NW 99th St SWF Retrofit	401886	Construct a detention/infiltration facility to provide water quality treatment and quantity control. Install a new flow control structure to reduce peak flows discharging to a downstream canyon and stream. Excavate detention area and backfill with an imported soil mix to promote infiltration, and revegetate using native plants to create a rain garden.	1.9	5	0	1.9	67	Improve aesthetics and groundwater recharge; provide education	$75,533	$136,269	Complete	2010
Structural Stormwater Control	Maplegate SWF Retrofit	401885	Modify existing flow control structure to gain approximately 0.5 ac-ft of additional detention capacity and reduce runoff discharged to Tenny Creek.	0	0	0	0	60		$40,365	$85,467	Complete	2010
Repair	Mt. Vista Stormwater Facility Repair	401732	Reconstruct the stormwater pond to include liner, repair existing monitoring/flow control structures inside the facility, repair the breached berm, and stabilize the failed slope.	0	0	0	0	0	Stabilize hillside adjacent to SWF	$213,840	$328,954	Complete	2010
Flow Control Mitigation Program	NE 152nd St/NE 20th Ave Facility Retrofit	400830	Construct a two-cell wetpond at the headwater of a small tributary of Whipple Creek to provide enhanced water quality treatment and detention storage. Install a flow control structure upstream of an existing earthen dam crossing the tributary stream, approxiamtely 400 feet downstream of the stormwater facility, to create additional storage and further reduce peak flows. Remove invasive species and plant native vegetation.	6	25.5	0	14.5	63	Improve wetland and riparian habitat; aesthetics	$1,047,000	$971,676	Complete	2010
Structural Stormwater Control	NE 32nd Avenue SWF Retrofit	401947	Install additional twin 72" CMP storm sewer pipes to provide additional underground storage to improve stormwater control and reduce erosion in an unstable reach of Tenny Creek.	0	0	0	0	77		$540,911	$607,352	Complete	2010
Flow Control Mitigation Program	NE Hazel Dell & 115th Cir SWF Retrofit	401877	Construct a wetpond to provide water quality treatment and increase detention storage for a highly developed drainage area near Suds Creek. Install a bio-bag retaining wall and revegetate with willow stakes.	3.6	5.5	0	2.3	31	Improve aesthetics	$341,500	$545,853	Complete	2010
Structural Stormwater Control	New Valley SWF Retrofit	401889	Construct rain gardens in place of existing bio-filtration swale to improve water quality treatment. Remove silt from infiltration basin and regrade facility side slopes to increase infiltration area.	0.3	0	0	0	70	Improve aesthetics	$330,000	$351,232	Complete	2010
Flow Control Mitigation Program	NW 4th Avenue/NW 90th Street SWF	401948	Construct a new stormwater facility along Cougar Creek to provide runoff treatment for a fully developed area with single family homes and local roadways. Plant trees and native shrubs.	1	5.3	0	2.9	71		$214,952	$362,013	Complete	2010
Repair	Regency Park Subdivision / Mill Creek Tributary Outfall Redesign	401631	Construct a new flow spreader, plant native vegetation in riparian area, stabilize slope using branch packing.	0	0	0	0	0	Stabilize stream channel using bio-engineering	$42,000	$39,184	Complete	2010
Flow Control Mitigation Program	Teal Pointe SWF Retrofit	401632	Modify two existing stormwater facilities to combine into a new stormwater wetland to improve facility's overall performance. Re-vegetate with native trees and shrubs. Improve community access through facility to the Salmon Creek Greenway trail.	2.2	3.7	0	1.3	51	Improve aesthetics and Salmon Creek Greenway access	$716,520	$424,121	Complete	2010
				15.6	48.8	0	24.1		Sub Totals:	$3,829,937	$4,211,338		
Flow Control Mitigation Program	Becker North Reforestation Project	28397	Reforest approximately 14.7 acres of a county owned property (Parcel#212149000).	0	0	14.7	0	0	Improve habitat	$83,512	$83,619	Complete	2011

Program	Project Name	Project Number	Description	Flow Control Restoration to Historic					Other Environmental Benefits	Estimated Cost	Actual Cost	Project Status	Completion Year
				Water Quality Benefit (tons TSS reduction/yr)	Lawn	Pasture	Impervious	Hydrology Benefit (% reduction in 2-yr flow)					
Flow Control Mitigation Program	Buena Vista Subdivision SWF Retrofit	401888	Retrofit two stormwater facilities in Vista Meadows Neighborhood Park to improve water quality treatment and provide additional storage volume. Convert existing ponds to wetland/rain gardens that treat and detain runoff from Buena Vista subdivision, Vista Meadows Park, and NE 29th Avenue.	0.4	1.7	0	1.5	82	Improve aesthetics and increase groundwater recharge	$223,850	$296,244	Complete	2011
Flow Control Mitigation Program	Daybreak Park Reforestation Project	28394	Reforest approximately 5.1 acre of park site at Daybreak Park (Parcel#225383000).	0	0	5.1	0	0	Improve habitat	$7,350	$32,987	Complete	2011
Flow Control Mitigation Program	Durkee Property Reforestation Project	28399	Reforest approximately 7.2 acres of county owned parcel (Parcel#236073000).	0	0	7.2	0	0	Improve habitat	$44,216	$50,504	Complete	2011
Flow Control Mitigation Program	Fairgrounds Park Reforestation Project	28398	Reforest approximately 13.1 acres of county owned parcel (Parcel#182160000) located to the west of Fairgrounds Community Park.	0	0	13.1	0	0	Improve habitat and provide education	$78,664	$102,035	Complete	2011
Flow Control Mitigation Program	Ford Property Reforestation Project	28400	Reforest approximately a 10.6 acre portion of the county owned parcel (Parcel#180848000).	0	0	10.6	0	0	Improve habitat	$66,421	$83,055	Complete	2011
Structural Stormwater Control	Grassland Meadows Subdivision SWF Retrofit	401873	Retrofit an existing stormwater facility to provide enhanced water quality, increase retention, and reduce stream erosion in Curtin Creek. Replace an old 3-cell biofiltration swale/detention facility with a more modern bioretention cell/retention pond design.	0.78	0	0	0	54	Improve aesthetics	$267,500	$227,185	Complete	2011
Flow Control Mitigation Program	Greyhawk NH Park Reforestation Project	28395	Reforest approximately 2 acres of Greyhawk Neighborhood Park to improve hydrology and aesthetics.	0	0	2	0	0	Improve aesthetics and provide urban habitat	$10,237	$15,166	Complete	2011
Flow Control Mitigation Program	LaLonde NH Park North Reforestation Project	401881	Reforest 1.6 acres of the north end of LaLonde Neighborhood Park.	0	0	1.6	0	0	Improve aesthetics and habitat	$73,521	$77,732	Complete	2011
Repair	LaLonde Parkside East SWF Outfall Repair	401881	Repair damaged outfall for Lalonde Parkside East stormwater facility.	0	0	0	0	0	Stabilize stream bank	$20,000	$77,732	Complete	2011
Structural Stormwater Control	NE 149th St Rock Storage Facility Rain Garden Project	402243	Construct two large bioretention facilities along NE 149th Street within county property to capture stormwater runoff from the storage site to provide improved water quality treatment and stormwater infiltration.	1.6	0	0	0	0	Improve aesthetics Increase groundwater recharge	$153,284	$176,078	Complete	2011
Repair	Sherwood VI SWF Repair	401883	Replace the existing outlet flow control structure with a functional flow control structure, re-establish the maintenance access road, remove sediment in portions of the detention pond, rock stabilize the existing embankment, install rock aprons at the primary inlet and outlet of the pond, line the existing outlet pipe with a sleeved HDPE pipe (and grouted annulus), re-establish and protect the downstream embankment slope and rip-rap at the outfall.	0	0	0	0	0	Stabilize outfall/stream bank	$163,976	$164,473	Complete	2011
Structural Stormwater Control	SR-503/ Fred Meyer Stormwater Facility	400904	Construct new stormwater infiltration and filtration systems to treat and dispose runoff from approximately 1.2 acres of State Route (SR-503).	0.2	0	0	0	0	Separate public and private storm water systems for spill protection	$268,130	$268,130	Complete	2011
Flow Control Mitigation Program	Veatch Property Reforestation Project	28396	Reforest approximately 1.1 acres of county owned property (Parcel#196541000).	0	0	1.1	0	0	Improve habitat	$7,350	$8,906	Complete	2011

Program	Project Name	Project Number	Description	Flow Control Restoration to Historic					Other Environmental Benefits	Estimated Cost	Actual Cost	Project Status	Completion Year
				Water Quality Benefit (tons TSS reduction/yr)	Lawn	Pasture	Impervious	Hydrology Benefit (% reduction in 2-yr flow)					
Structural Stormwater Control	Whipple Creek Stream Restoration (RM 7.8-8.4)	400900	Construct a series of rock structures to provide grade control and install valley spanning log jams in the stream channel and floodplain. Reconnect stream to floodplain to increase flood storage and retention. Remove invasive vegetation and replant the riparian buffers with native vegetation.	0	0	0	0	0	Stop headcuts and limit future channel incision; enhance wetland and riparian habitat	$728,801	$774,687	Complete	2011
				2.98	1.7	55.4	1.5		Sub Totals:	$2,196,811	$2,438,533		
Flow Control Mitigation Program	Harding Farms SWF Retrofit	401882	Construct a stormwater wetland to provide detention and water quality treatment for runoff from approximately 60 acres of fully developed residential area.	5.2	4	0	5	21	Improve wetland habitat	$1,085,800	$0	Design	2012
Structural Stormwater Control	Heritage Meadows Subdivision SWF Retrofit	402497	Replace the existing bio-swale with a bioretention facility to improve water quality treatment. Remove existing substandard maintenance access and construct a standard maintenance road on the east side of the facility.	0.14	0	0	0	0	Improved aesthetics of the area	$126,213	$0	Design	2012
Flow Control Mitigation Program	Hockinson Meadows Park Reforestation Project	28530	Plant native trees and shrubs on approximately 17.2 acres area around the perimeter of the county owned park (Parcel No. 200548000).	0	0	17.2	0	0	Habitat improvement and aesthetics	$181,407	$0	Construction	2012
Structural Stormwater Control	Hoffman Heights Subdivision SWF Retrofit	402494	Replace the existing bio-swale with a larger rain garden to improve water quality treatment and to reduce runoff volume to be discharged to the existing infiltration system through retention.	0.25	0	0	0	22	Improve aesthetics of the area and increase groundwater recharge	$97,128	$0	Design	2012
Flow Control Mitigation Program	Mackie Park Reforestation Project	28531	Plant native trees and shrubs in 1.8 acres area around the perimeter of the Mackie Park (Parcel no. 154442-000 & 154445-000).	0	0	1.8	0	0	Habitat improvement and aesthetics	$20,411	$0	Construction	2012
Structural Stormwater Control	Mt. Vista Subdivision LID Retrofit	402244	Install a minimum of 15 stormwater curb extensions and planters through out Mt. Vista subdivision to provide water quality treatment and flow reduction to help reduce runoff volume discharged to the existing detention pond and receiving stream.	2.3	0	0	0	7	Improve aesthetics and groundwater recharge	$245,720	$0	Design	2012
Flow Control Mitigation Program	Padden-Andresen SWF	401946	Construct a stormwater wetland to detain and treat runoff from approximately 30 acres of major roadways and commercial development near Padden Parkway-Andresen Rd intersection in the headwaters area of Curtin Creek.	1.6	1	0	5	48	Habitat improvement Improved aesthetics	$1,600,445	$0	Design	2012
Flow Control Mitigation Program	Parkside Manor SWF Retofit	401890	Combine three undersized stormwater facilities discharging insufficiently treated stormwater to an intact headwater wetland that is also at risk of draining due to downstream headcuts and channel incision.	0.9	11	0	8	80	Habitat improvement and aesthetics	$1,377,640	$0	Design	2012
Structural Stormwater Control	Pleasant Valley Springs Riparian Restoration	28410	Restore about 2 acres of riparian habitat by removing 20,000 square feet of invasive species and planting an estimated 1,500 native plants in undeveloped Pleasant Valley Park near Salmon Creek.	0	0	0	0	0	Improve habitat and provide education	$23,000	$0	Construction	2012
Flow Control Mitigation Program	Schaefer Levee Site Reforestation Project	28527	Plant native trees and shrubs on approximately 20.7 acres of county owned land (Parcel No. 211723000, 211677000, and 211474000).	0	0	20.7	0	0	Habitat improvement and aesthetics	$221,194	$0	Construction	2012
Structural Stormwater Control	Stag Leap Canyon SWF Retrofit	402492	Replace an existing bio-swale with a bioretention facility to provide enhanced water quality treatment and increased infiltration capacity to help reduce runoff volume discharged to the existing infiltration system (drywells/perforated pipes).	0.37	0	0	0	54	Increased groundwater recharge and habitat improvement	$116,826	$0	Design	2012

Program	Project Name	Project Number	Description	Flow Control Restoration to Historic					Other Environmental Benefits	Estimated Cost	Actual Cost	Project Status	Completion Year
				Water Quality Benefit (tons TSS reduction/yr)	Lawn	Pasture	Impervious	Hydrology Benefit (% reduction in 2-yr flow)					
Repair	Stones Throw Subdivision SWF Repair	403264	Reconstruct the existing bio-swale by excavating/re-grading to provide water quality treatment.	0	0	0	0	0	None	$37,448	$0	Design	2012
Structural Stormwater Control	Sunset Glen/ Drasler Place Subdivision SWF Retrofit	402245	Combine two adjacent stormwater facilities and construct a bioretention facility to improve water quality treatment and infiltration capacity.	0.27	0	0	0	0	Improve aesthetics and groundwater recharge	$155,000	$0	Design	2012
Flow Control Mitigation Program	University Place Reforestation Project	28525	Plant native trees and shrubs in approximately 2.1 acres of county owned land (Parcel no. 181986-070) around University Place subdivision stormwater facility.	0	0	2.1	0	0	Habitat improvement and aesthetics	$24,547	$0	Construction	2012
Flow Control Mitigation Program	Vancouver Lake 5 Reforestation Project	28526	Plant native trees and shrubs in approximately 2.8 acres of county owned land (Parcel no. 147354-000) near Vancouver lake.	0	0	2.8	0	0	Habitat improvement and aesthetics	$33,511	$0	Construction	2012
Flow Control Mitigation Program	Zimmerly Site Reforestation Project	28528	Plant native trees and shrubs in approximately 5.8 acres of county owned land (Parcel No. 212103000).	0	0	5.8	0	0	Habitat improvement and aesthetics	$62,185	$0	Construction	2012
				11.03	16	50.4	18		Sub Totals:	$5,408,477	$0		
Flow Control Mitigation Program	Clark County Amphitheater Stormwater Facility	402357	Replace the existing facility with a large wetpond to provide water quality treatment and greater detention storage for stormwater runoff from approximately 49 acres of mostly impervious drainage area.	0	3	0	8	0	Improve wetland habitat	$900,868	$0	Design	2013
Repair	Cold Creek Court Subdivision Stormwater Facility	TBD	Install a new infiltration trench to dispose a portion of runoff from the subdivision to minimize impact at the existing undersized stormwater facility. Install a pair of storm filter catch basins to capture and treat the runoff prior to sending it to the new infiltration trench.	0	0	0	0	0	None	$119,438	$0	Planning	2013
Repair	Fairfield SWF Retrofit	401764	Adjust the overflow elevation of the pond to make it lower than the low point in NE 37th Ave. It will resolve the frequently occuring flooding issues of the intersection of NE 37th Avenue and NE 92nd Street. Adjust the existing onsite manholes and reaches of pipe accordingly.	0	0	0	0	0	None	$140,000	$0	Design	2013
Flow Control Mitigation Program	NE 99th St & 25th Ave SWF	401902	Reconfigure existing stormwater facility to improve water quality treatment and gain additional detention storage by converting entire facility to a two-cell wetpond.	0	2.5	0	1.5	0	Improve habitat and aesthetics	$370,091	$0	Design	2013
Flow Control Mitigation Program	Thomas Wetland East	401972	Construct a stormwater pond/wetland to capture stormwater runoff from approximately 125 acres of a fully developed residential area. Plant native vegetation to enhance existing wetlands and improve the appearances of the stormwater facilities in the project area. Consider recreational opportunities such as walking paths that connect neighborhoods and nearby parks.	0	9.9	0	13.1	68	Improve wetland habitat and provide recreation	$2,195,168	$0	Design	2013
Structural Stormwater Control	Wildwood-4 Subdivision LID Retrofit	TBD	Construct a series of stormwater curb extension and planters along NW 4th Ave and NW 4th Circle to reduce runoff and provide water quality treatment prior to discharge to Cougar Creek.	0	0	0	0	0	Improve aesthetics and groundwater recharge	$183,000	$0	Planning	2013
				0	15.4	0	22.6		Sub Totals:	$3,908,565	$0		